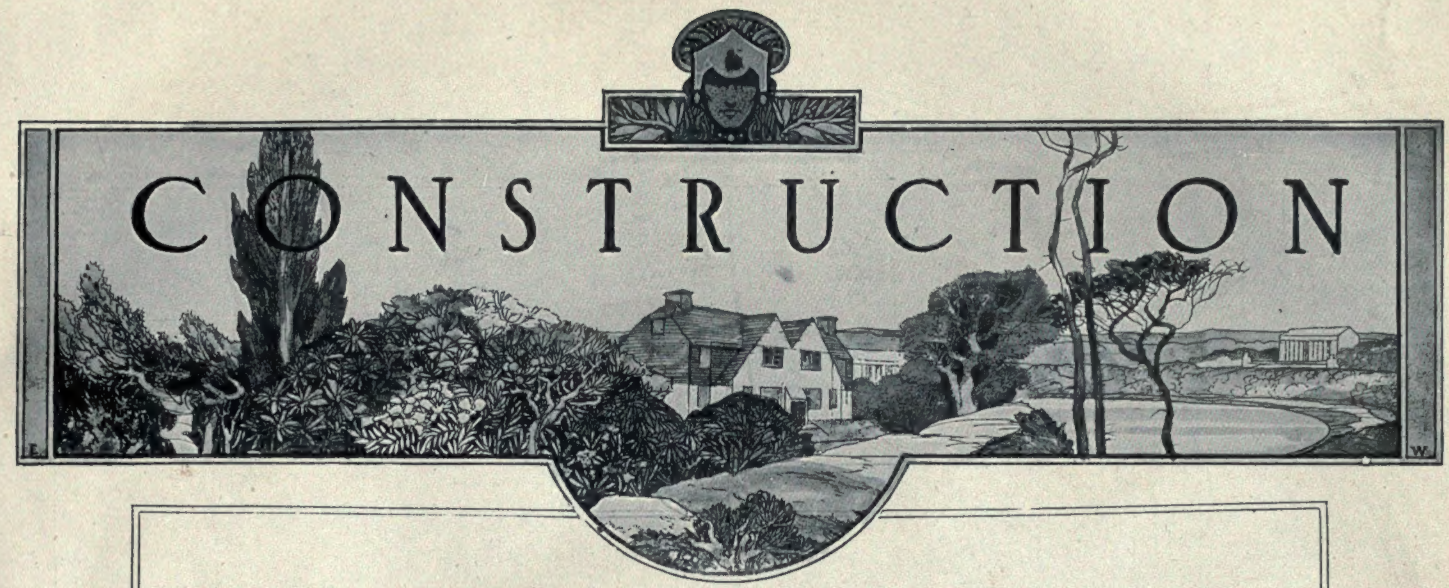
Molesworth, West & Secord
Registered Architects.

CARSWELL Co., Limited
Bookbinders,
PRINTERS,
LAW BOOKS,
PUBLISHERS, etc.
TORONTO
ONT.

GIFT
OCT 10 19[illegible]

P
Tech
C



CONSTRUCTION

January, 1920 Volume XIII., No. 1

LIBRARY
NOV 7 1968
UNIVERSITY OF TORONTO

CONTENTS

NEW GOVERNMENT OFFICES, OTTAWA, ONT. 3

EDUCATIONAL BLOCK, ROYAL MILITARY COLLEGE, KINGSTON, ONT. 6

HEATING PROBLEMS PRODUCED BY SOME OF THE MODERN METHODS OF BUILDING CONSTRUCTION 10
An address by W. B. MacKay, A.M.E.I.C.

IDEAL BREAD COMPANY'S BUILDING, TORONTO 14

HEAT TREATING BUILDING, DOWSLEY SPRING & AXLE COMPANY, CHATHAM, ONT. 18

WAREHOUSE OF THE CANADIAN CO-OPERATIVE WOOL GROWERS, LIMITED, WESTON, ONT. 20

THE DRAFSTMAN 22
An address by Chas. S. Cobb, Architect.

EDITORIAL 27
Toronto Live Stock Arena—Building Costs.

ONTARIO BUILDERS AND SUPPLY MEN TO MEET 28

BUILDING SUMMARY 29

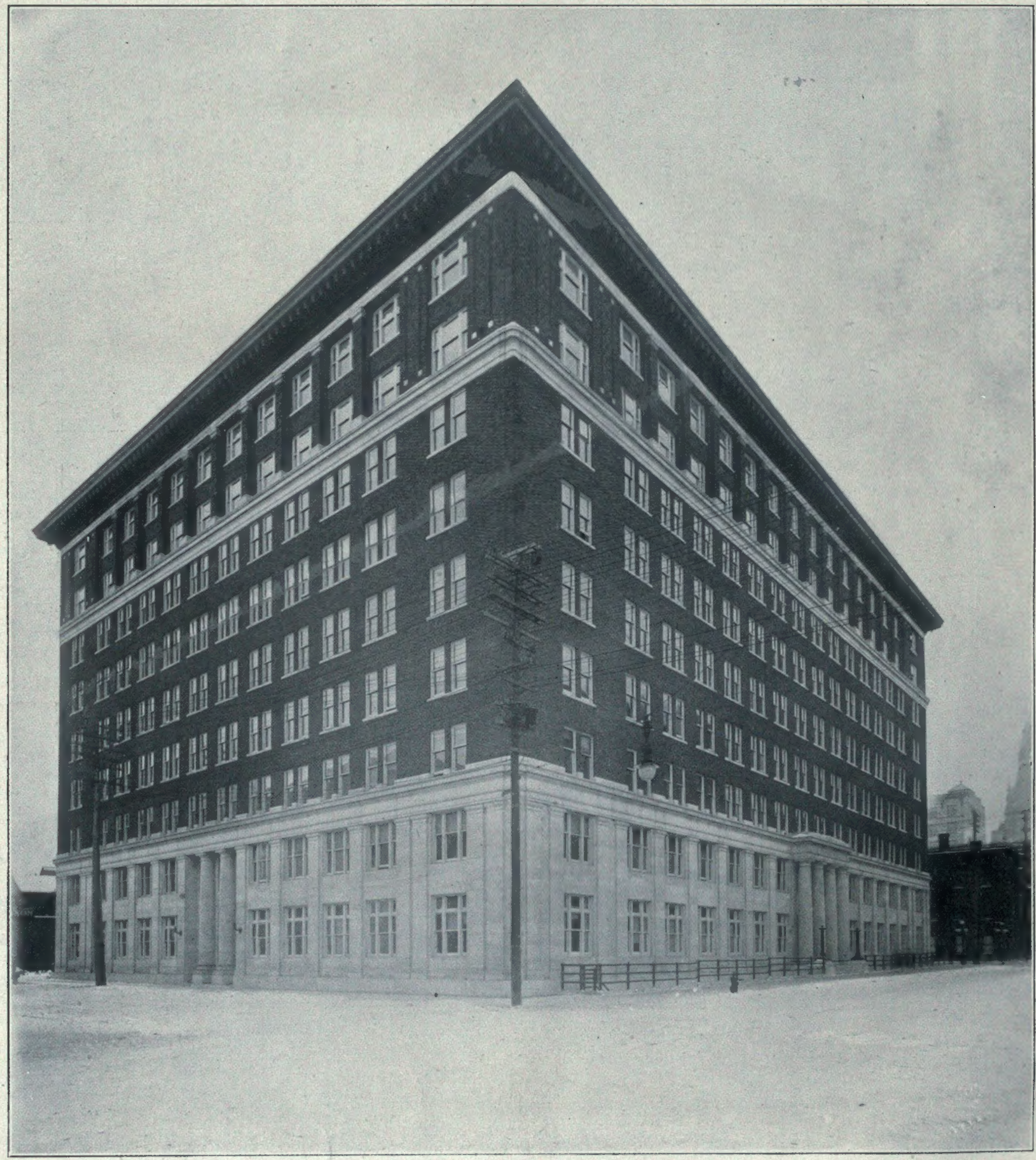
THE OUTLOOK 1920 29

PROPOSES WATERFRONT DEVELOPMENT, HAMILTON, ONT. 32

Frontispiece

NEW HUNTER BUILDING (GOVERNMENT OFFICES) OTTAWA, ONT. 2

H. GAGNIER, Limited, Publishers
GRAPHIC ARTS BLDG., TORONTO, CANADA
BRANCH OFFICES
MONTREAL NEW YORK



THE HUNTER BUILDING.

NEW GOVERNMENT OFFICES, OTTAWA, ONT.

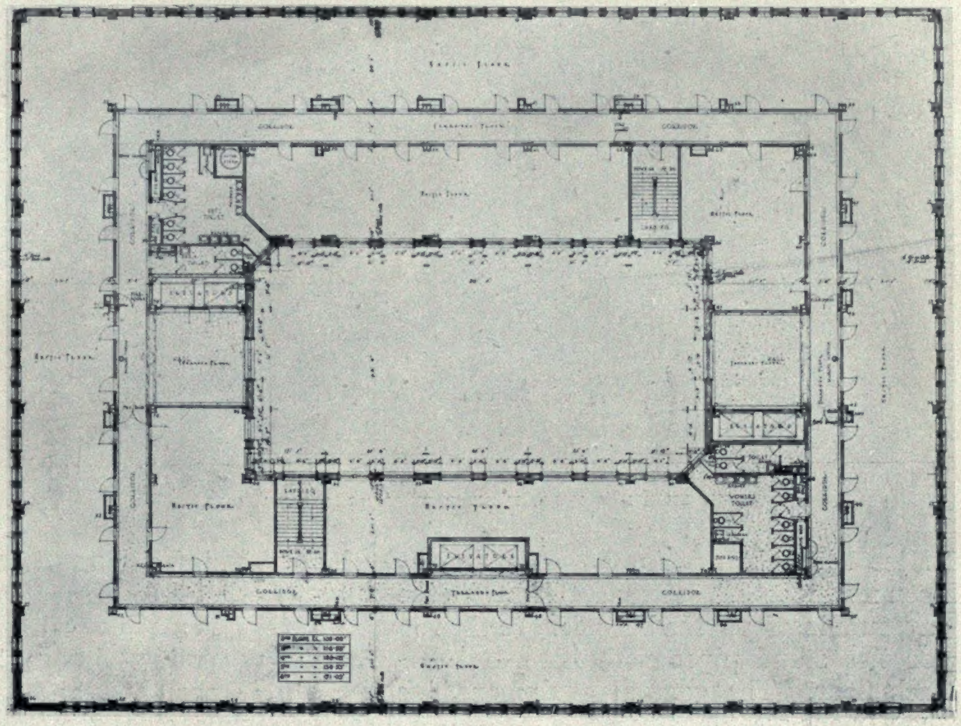
New Government Offices, Ottawa, Ont.

THE new Hunter Building just completed at Ottawa, centralizes under one roof various departmental staffs which have been heretofore scattered throughout the city, and thus ensure the more speedy and convenient transaction of Government business. Owing to the urgent need for accommodations for this purpose, and the fact that its erection was undertaken during the war period, the Government on strictly economical grounds deemed it inadvisable at the time to consider a building of a more monumental type. For the same reason the completed structure was also considered as an isolated unit, and does not conform to the official plan of Ottawa which was prepared jointly for the city and the Government at a cost of $70,000.

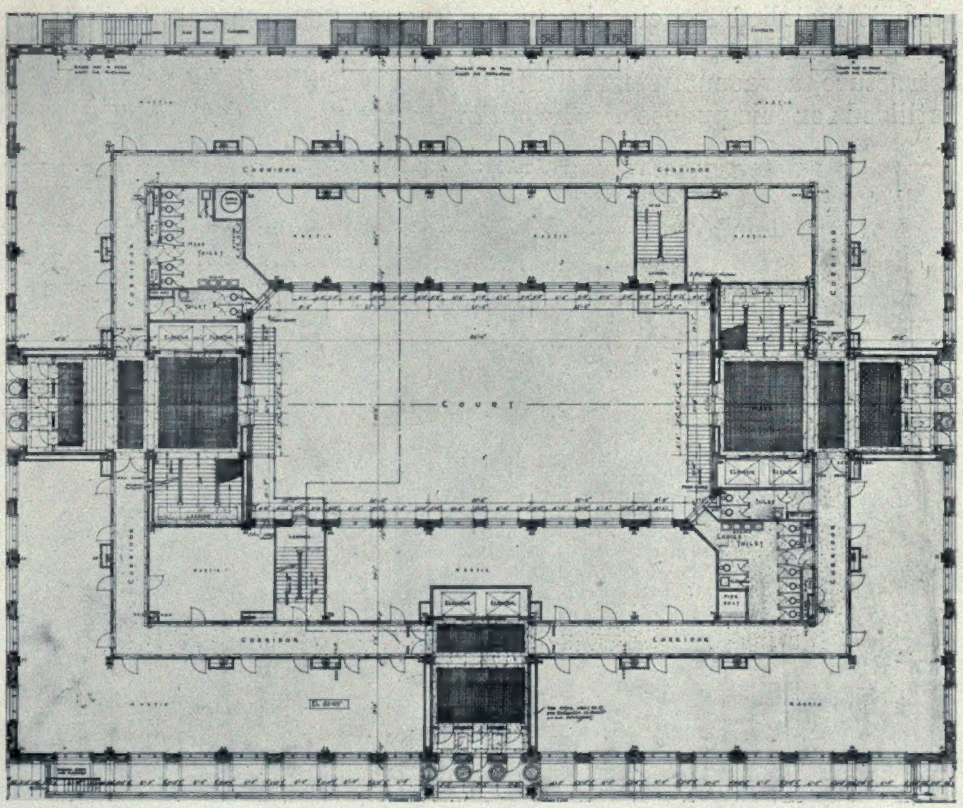
The building has therefore been designed and planned along the commercial lines of a modern office building and so constructed as to most economically meet the requirements for which it is intended. The frame work is of skeleton steel construction encased in concrete and carried on steel columns from the foundation rock. The floor system is of reinforced concrete with mastic finish and the partitions throughout are of gypsum blocks. Granite is used to approximately the ground floor level, with two stories of limestone above, the remaining stories being a light tapestry brick with stone trimmings and backed by twelve-inch hollow tile.

Entrance to the building is obtained from O'Connor, Queen and Albert streets, through vestibules to the elevator halls, from which corridors on the several floors give access to the various offices. The main entrance halls on the ground floor have marble dadoes and marble mosaic floors, all other halls and corridors having terrazzo floors with a seven-foot cement dado finished with white vitrolite enamel.

There are three batteries of elevators of two cars each, one battery at each of the three entrances, which ensure speedy distribution to all



TYPICAL FLOOR PLAN.

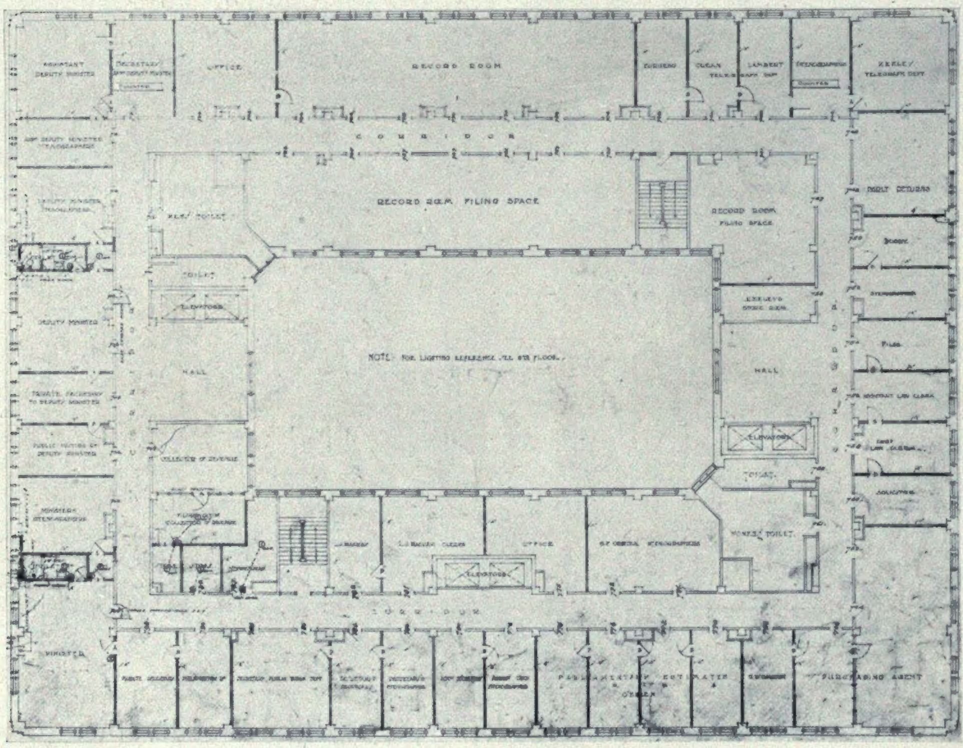


GROUND FLOOR PLAN

MAIN ENTRANCE HALL, HUNTER BUILDING, OTTAWA, ONT.

offices throughout. Ample provision has also been made for fire escape stairs inside the building, running from the basement to the roof; also for two stand pipes with hose attachment on each floor. The general equipment, including the various staff lavatories, is modern and sanitary in character, and a vacuum cleaning system is installed for cleaning the offices, corridors and halls. Steam is employed to heat the structure, a vacuum steam-heating plant being utilized for this purpose. The ventilation is accomplished by two large plenum fans, air washers, etc., placed in the basement with a system of fresh air to the corridors throughout.

The building was designed by the Chief Architect's staff of the Department of Public Works, Ottawa. It is nine stories above the sidewalk level, and cost approximately a million and a half dollars.



SEVENTH FLOOR PLAN, HUNTER BUILDING, OTTAWA, ONT.

Educational Block

Kingston, Ont.

A perspective drawing, detail and plans are also shown in this issue of the new educational block now in course of erection at the Royal Military College, Kingston, Ont., which will provide accommodation for three hundred cadets. This building will consist of a large central portion with tower containing main entrance hall with marble staircase leading to upper floors and marble staircase leading to upper floors and basement. The east and west extensions provide class-rooms, lecture rooms and administration offices. The northern annex contains a large assembly room with galleries and machinery hall in the basement for applied science.

At present there is only being erected the central portion (without the tower), the west wing and the assembly room annex.

The drawings and specifications were also prepared by the Chief Architect's staff of the Public Works Department, Ottawa, and the construction is being supervised locally by a representative of this staff. The contractors are Pigott and Healy.

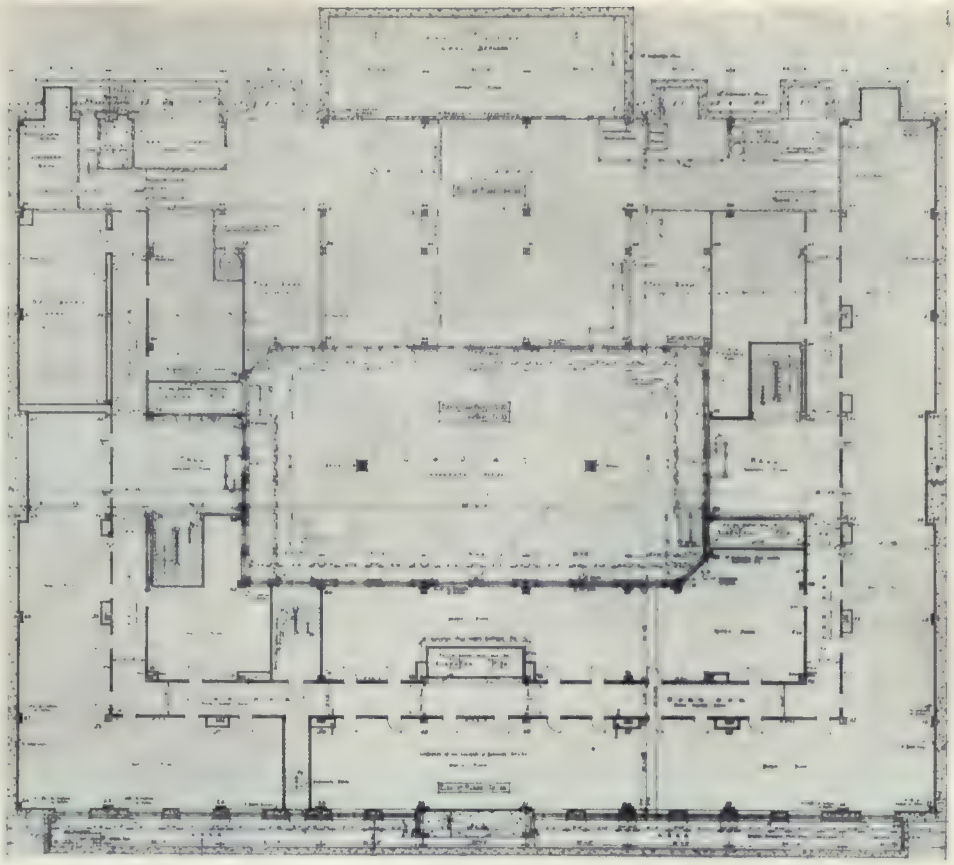
The building is fireproof throughout, the outer walls being constructed of limestone and floors of reinforced concrete, the roof of steel covered with concrete and asbestos slates. The halls, corridors, wash-rooms, etc., are finished in terrazzo with marble borders.

Mechanical ventilation

of the most up-to-date method is provided, and the building is lighted throughout by electricity and heated by steam, the direct and indirect method being adopted owing to the exposed position of the building.

The assembly hall and all halls and corridors are finished in quartered oak, and a large and commodious stage is provided in the assembly hall together with all required exits, etc.

Owing to the high cost of materials and labor, everything has been considered with a view to economy as far as possible without loss of efficiency, or the fact that the building is the central feature of the most important Dominion Government Educational Institution in Canada.



BASEMENT PLAN, HUNTER BUILDING, OTTAWA, ONT.

Rustless Steel

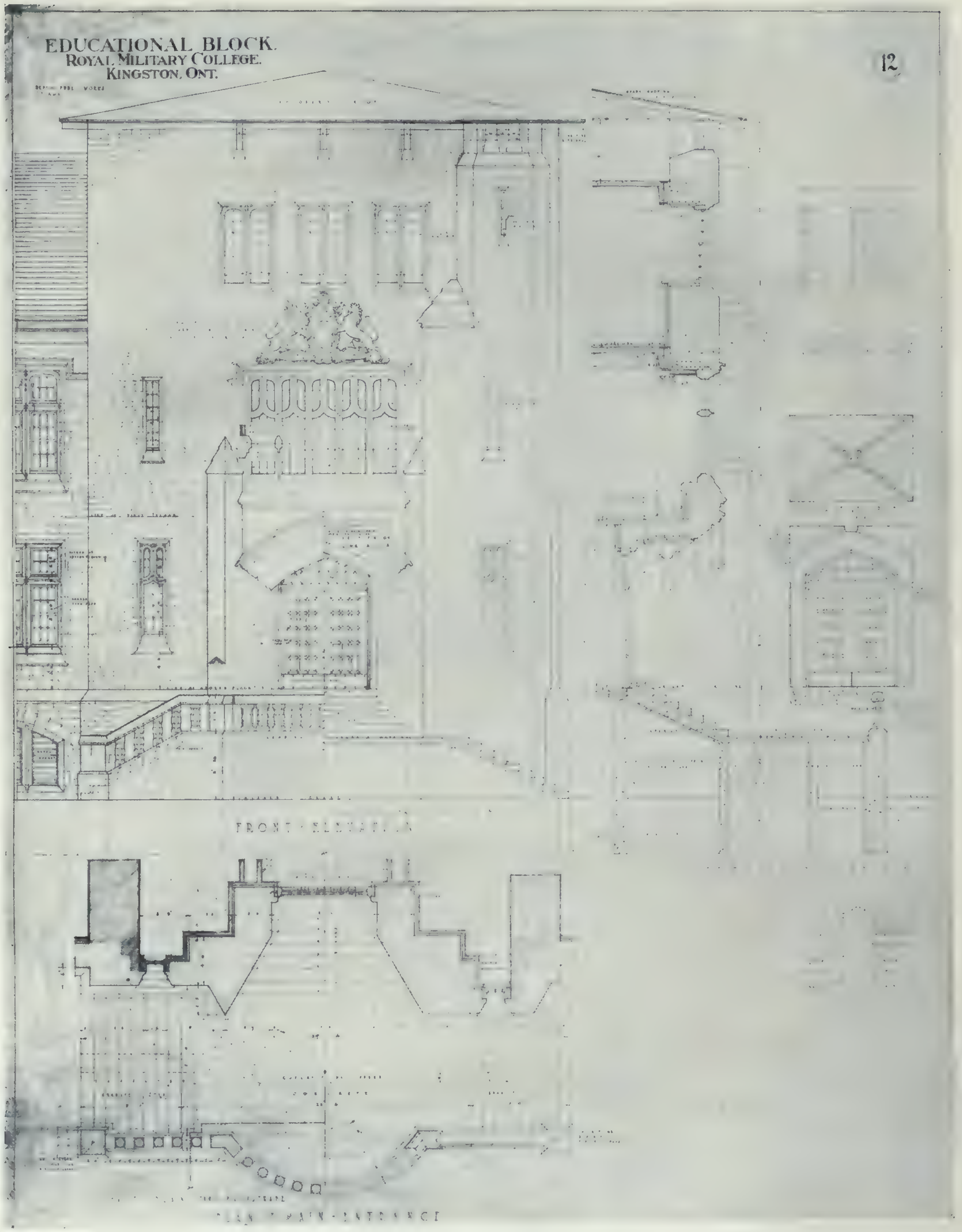
The "Scientific American," in describing a new kind of rustless steel, states that the new metal, with a bright surface and able to resist the corroding effect of air, water and acids without staining, was discovered just prior to the outbreak of the war, and was immediately commandeered by the British Government for use in airplane construction and for purposes where strength and durability, combined with rust-resisting qualities, were invaluable.

The steel is a Sheffield invention, and was chanced upon largely by accident. A local metallurgist, Mr. Harry Brearly, author of numerous standard works, was experimenting in the armament shop to find a means of preventing erosion in gun tubes. After some of his experiments he noticed that certain pieces of chrome steel had not not suffered from corrosive influences under conditions which would have rusted ordinary steel. He followed up this clue, and what is known as stainless steel was eventually worked out and added to Sheffield's metallurgical triumphs.

◆

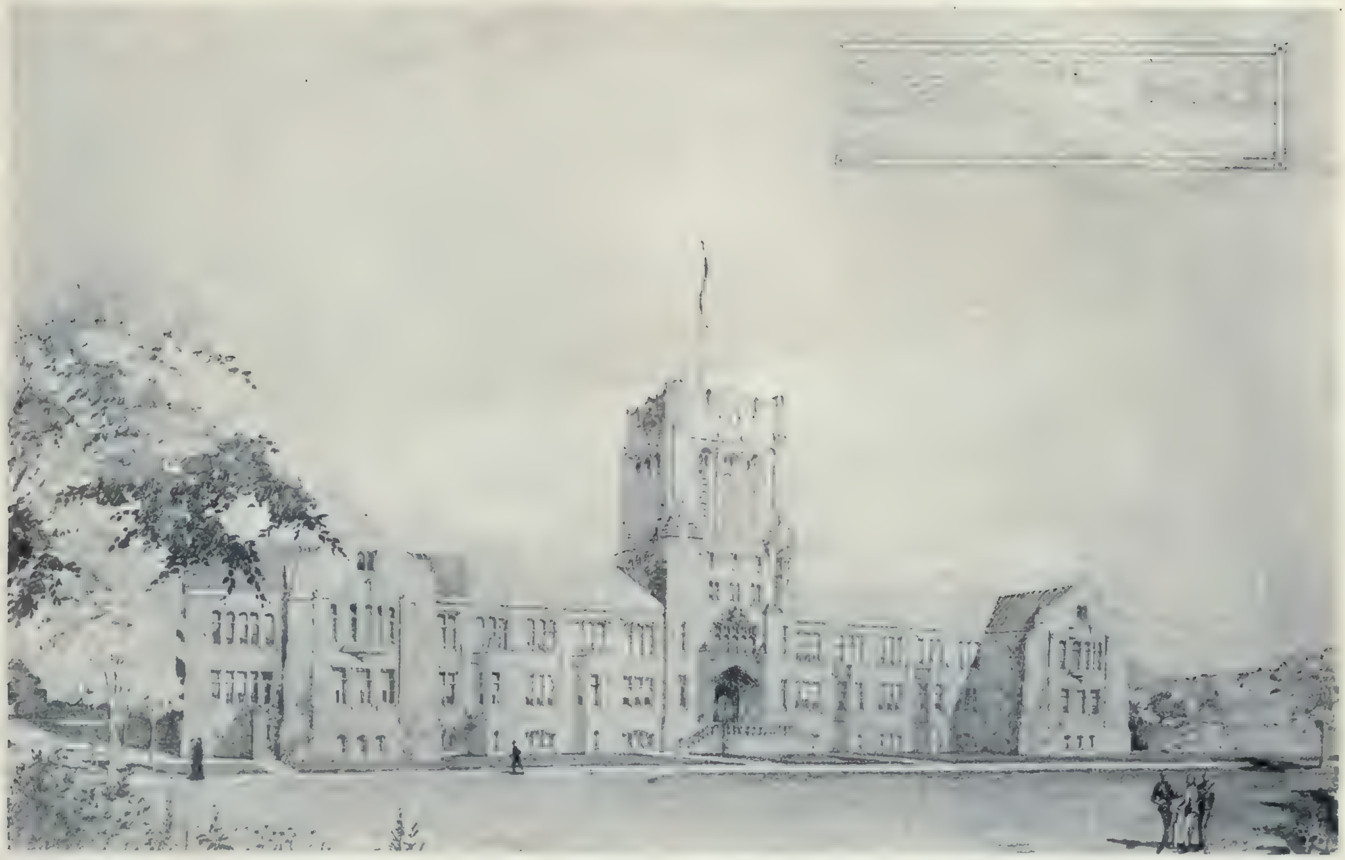
A by-law for a new bridge to be erected over the Grand River has been carried by the ratepayers of Brantford, Ont. The structure will cost $211,000.

CORRIDOR AND ELEVATORS, HUNTER BUILDING, OTTAWA, ONT.



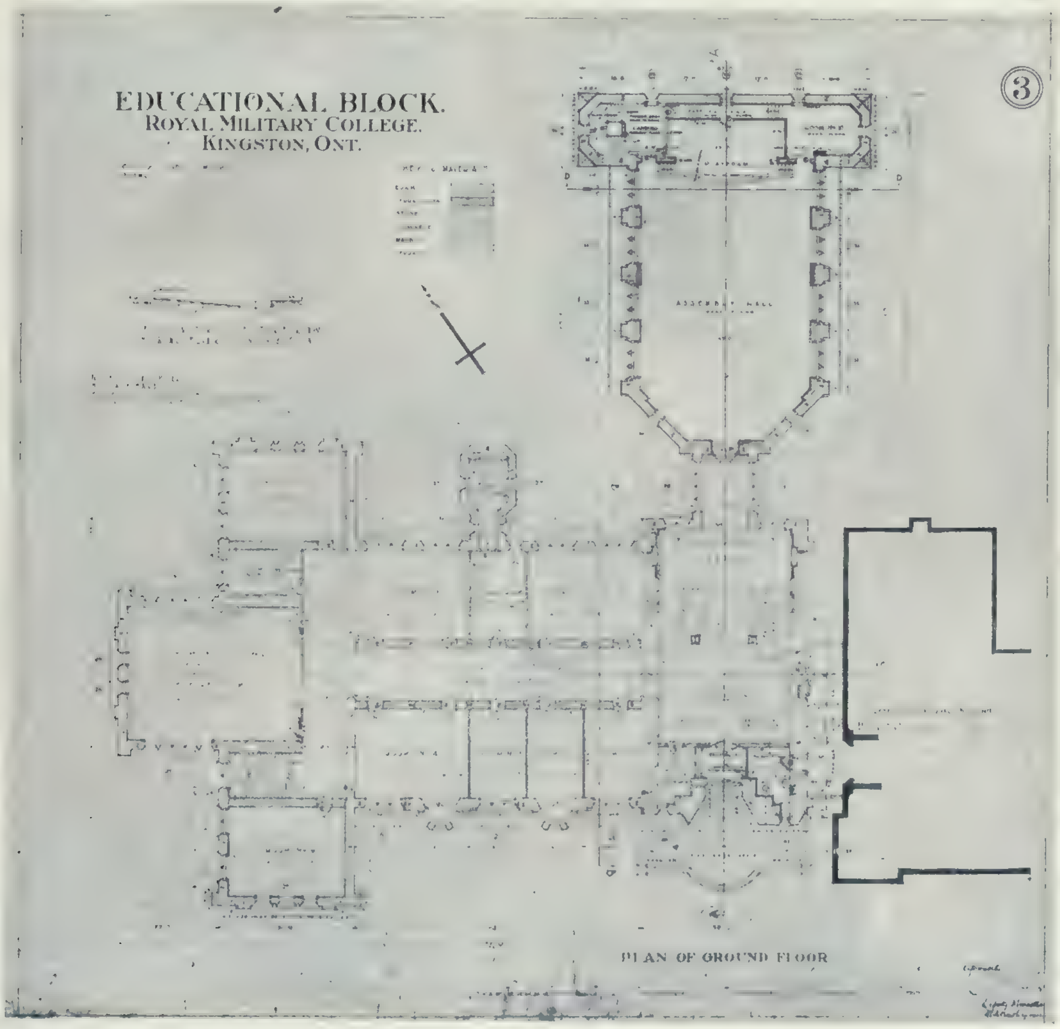
DETAIL OF MAIN ENTRANCE.

NEW EDUCATIONAL BLOCK, ROYAL MILITARY COLLEGE, KINGSTON, ONT.



PERSPECTIVE VIEW.

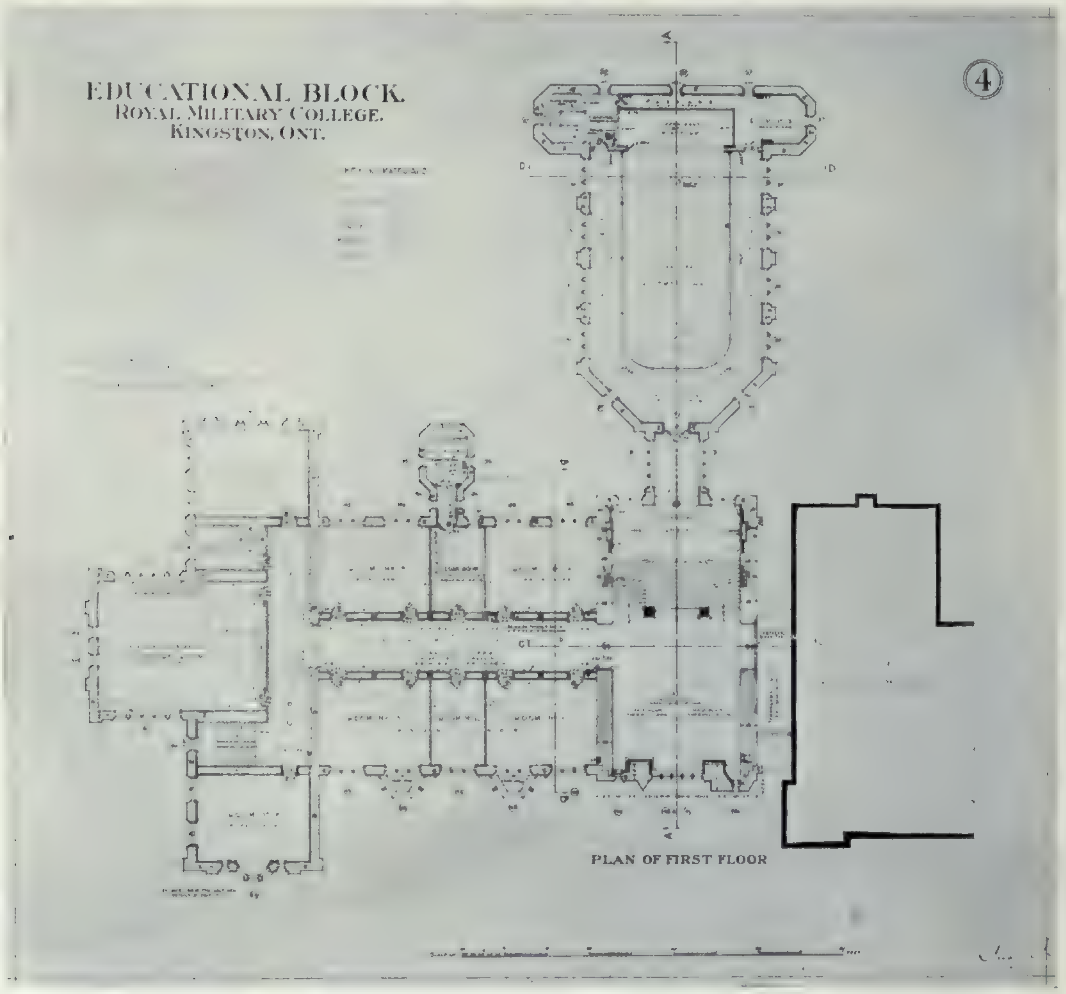
NEW EDUCATIONAL BLOCK, ROYAL MILITARY COLLEGE, KINGSTON, ONT.



GROUND FLOOR PLAN.

Foundation Work—Bank of Hamilton Building, Winnipeg

An engineering problem of interest in connection with the new Bank of Hamilton Building, Winnipeg, illustrated in our previous issue, was involved in the construction of the foundations which were carried through to rock by the Chicago well method. Under this ten-storey structure there are in all 28 piers, of which twelve are 5 ft. in diameter, and sixteen 4 ft. 6 in. in diameter. These are built of 1:2:4 concrete and reinforced with one-half inch spiral rods and 1 inch vertical rods. This reinforcing extends down from the top of the pier to a distance varying from 9 ft. to 11 ft. 6 in.



FIRST FLOOR PLAN, NEW EDUCATIONAL BLOCK, ROYAL MILITARY COLLEGE, KINGSTON, ONT.

The average depth of the rock was 62 ft. below the sidewalk level. The upper portion of the excavation was through typical Winnipeg blue clay, and the last 10 ft. or 15 ft. was through hard pan. The rock was found to be fairly uniform in elevation, and with the exception of a few cases, was clean and solid, and it was not necessary to remove any of it.

All the piers were sunk before the old six-storey brick building was taken down. Tripods were set up on the floor of the main banking room, and openings were cut in the floor through which the excavation was handled. Two lines of tripods were set up at once, working alternate rows of piers, and alternate piers in each row. Two steam hoists in the streets operated continuously two endless cables, which drove the nigger heads over the welds. The line from the bucket in the well was snubbed around this constantly revolving nigger head, and the excavated material thus brought to the surface. It was dumped direct into wheelbarrows and was carried out on to a platform on McDermott Avenue, where it was dropped into wagons.

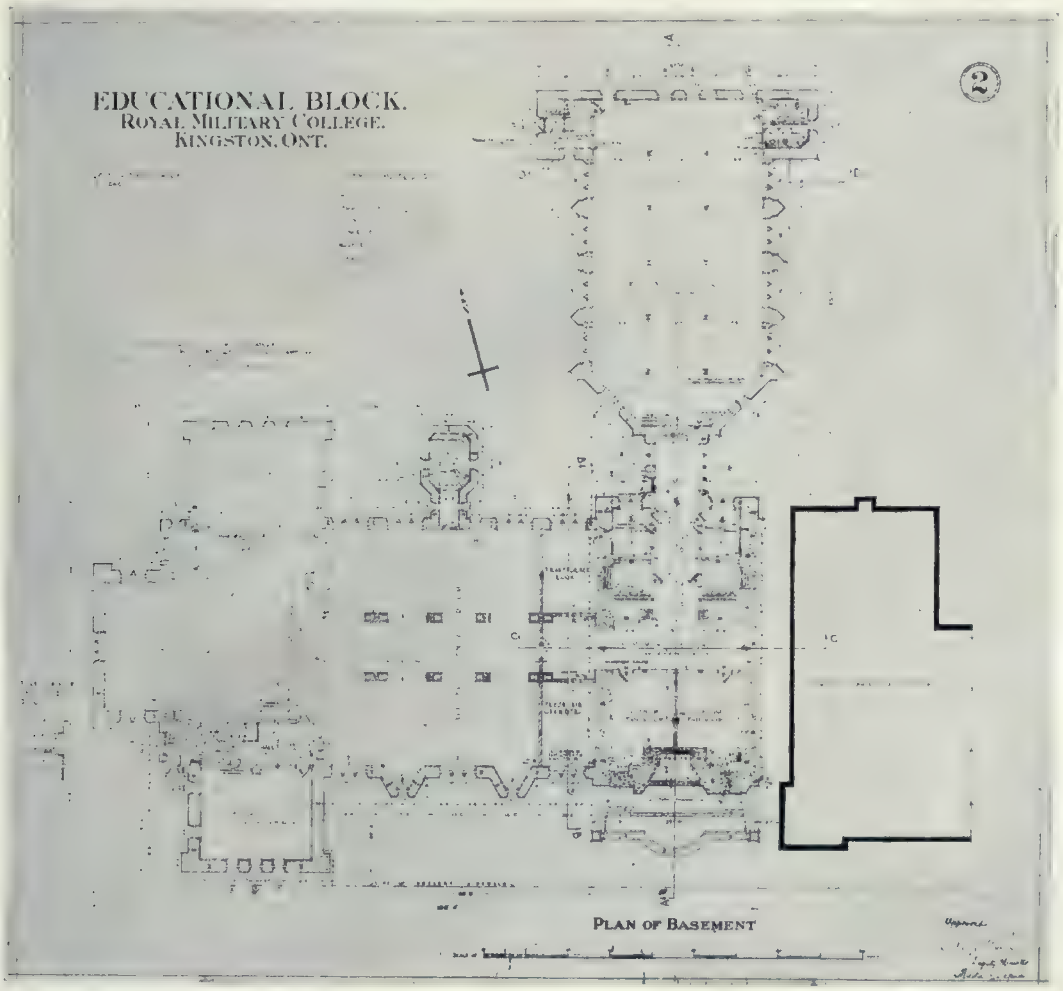
As the excavation proceeded, the wells were lagged with 2 in. x 6 in. rough lumber. This lagging was held in place by ¾ in. x 3 in. iron rings. When hard pan was reached, the lagging was stopped, as the remaining material stood up well without it. The hard pan was very difficult to dig. This material when wet is easy to handle, but the absence of water made the operation almost as expensive as rock excavation.

The concrete mixer was set up in the basement of the building, and the materials were conveyed to it by gravity from storage piles at the street level. The concrete was distributed by buggies and deposited in the wells through 10-in. pipes.

A day and a night shift were worked together throughout. Each shift did 10 hours, and the record set up was very creditable. The excavation started on May 20th, 1916, and the 28 piers were sunk and the concrete poured by June 20th, 1916. This is an average of one pier excavated and concreted per day.

A 90 h.p. boiler was set up on the sidewalk in case water troubles should develop. However, no water was encountered except a small amount from the surface, and the pumps were never operated. On account of the Smoke By-Law, coke was used instead of soft coal for all boilers.

Now that Winnipeg has abandoned its many wells from which it formerly secured it supply of water, it will be interesting to see how the rising water level throughout the city will affect the clay upon which so many buildings depend for their support. As pointed out previously, the clay encountered in the work just described was very hard and very dry.



BASEMENT PLAN, NEW EDUCATIONAL BLOCK, ROYAL MILITARY COLLEGE, KINGSTON, ONT.

The foundation work was done by The Foundation Company, Limited, of Montreal and Vancouver, under the supervision of J. D. Atchison, Architect, of Winnipeg.

◆

Housing Architect Appointed

The following personal item appeared in a recent issue of the American Architect:

"J. H. Appeldorn, formerly of York & Sawyer, and recently with the U. S. Shipping Board Emergency Fleet, Housing Corporation, has been appointed architect and general superintendent for the Modern Housing Corporation of Michigan and the Modern Dwelling Corporation, Ltd., of Canada, both subsidiary companies of the General Motors Corporation. He desires catalogues sent to his office, 435 Woodward Avenue, Detroit, Mich."

The Canadian company is at present carrying out an important housing project for the General Motors Corporation at Oshawa. A number of the houses have already been completed. They are said to be very creditable as to design and grouping, with considerable variety to plan and elevation, which will result in an attractive scheme when the project is fully developed.

◆

At the annual meeting of the Toronto Builders' Exchange, the following were elected officers for the following year: President, C. Blake Jackson; Past President, A. D. Grant; First Vice-President, J. M. Scott; Second Vice-President, W. H. Painter; Treasurer, John Aldridge; Secretary, David J. Davidge. Directors, John V. Gray, T. L. Fraser, James Phinnemore, W. E. Dillon, J. Robert Page, Jas, Munro, Jas. McLeod.

Heating Problems Produced by Some of the Modern Methods of Building Construction

*By W. B. MacKay, A.M.E.I.C.**

THE early history of the modern sciences is more or less legendary and traditional, which leaves much to surmise. The primitive races in the valleys of the Tigris, Euphrates and the Nile, were many decades upon their way towards civilization, as we know it, before we began to learn anything of their history. This we know, however, that as the human family grew, it spread out and there are now branches of the original peoples in every quarter of the globe with remnants of their ancient mythology still observable. Sufficient for our purpose is the fact that we find human beings living under remarkable and severe conditions. The Eskimo in the far north, who is compelled to go without fire for months at a time, and the people of the Tropics who never see snow, and know nothing of frost. The ranges of temperature are from 60 below zero, to 120 degrees above—a full range of 180 degrees in the extremes.

The civilization of every country has been largely determined by the geographical conditions; the characteristics of the land and climate in which any race dwells, shape the mode of living and thus influence their intellectual culture.

It is said of Egypt that the climate is equable and of warm temperature, snow and frost being wholly unknown, while storm, fog and even rain are rare. This is true in a measure of the other valleys, so that while some protection against heat was necessary, there was no necessity to provide against inclement weather, hence the climate developed the qualities of their architecture.

The mention of the use of fire in their history is largely the sacrificial fires of their ancient philosophy. They recognized the part which the sun, the source of heat and light played, recognized it to this extent that it was a large part of their religion. The following extracts from a book on their ancient philosophies serves to show the veneration of that great luminary:

"The Syrian damsels sat weeping for an Adoni, mortally wounded by the tooth of winter." Adoni was the name of the mythical creature representing the sun. Indeed, the worship of the sun was the basis of all ancient religions. Almost every nation in the cradle of the human race had mythical being whose strength or weakness, virtues or defects more or less described in the sun's career through the seasons. To those ancient peoples light and heat were profound mysteries, as indeed they are to us. As the sun caused the day and his absence the night, when he journed north, spring and summer followed him, and when he journed south, autumn, inclement weather, cold and long dark nights ruled the earth. As his influence produced the leaves and flowers and ripened the harvest and brought the regular inundation, he necessarily became to them the most interesting object of the material universe, author of life, heat and ignition. The sun was to them the efficient cause of generation, for without him there was no movement, no existence, no form. He was the innate fire of bodies, the fire of nature. He was to them immense, indivisible, imperishable and everywhere present. It was the need of his light and heat and of his creative energy that was felt by all men and nothing was more fearful than his absence. The sun's influence, so beneficient, caused it to become identified with the principal of all that was good."

North to them was the place of death. The abode of winter and desolation, and naturally so because with such an easy means of livelihood as was provided by irrigation and the fertile land of the valleys mentioned, there was little incentive to explore beyond the unknown north. But as time marched on and with the development of the present day civilization, we find in the north temperate zone, the place once looked upon with fear and trembling by the simple minded ancients, the greatest race on the face of the earth, the Anglo-Saxon, whose sons successfully fought the enemy under every sky and in every climate, in peace as well, we can proudly think of the achievements of Scott at the South Pole, Perry at the North, Livingstone and Stanley in the heart of Africa, and countless others, and more intimately to Civil Engineers, Colonel Everest, who, nearly a century ago began the wonderful trigonometrical survey of India. As mentioned before, our geographical location has had a great deal to do with the development of that wonderful and mysterious "power of resistance," in fact, the medical fraternity has coined the phrase very much as we more generally speak of "the Human factor."

Going over the history of architecture, practically nothing is mentioned about any system or systems of heating, except in isolated cases. Quite evident the earliest race adapted themselves by food and raiment to withstand the extremes of temperature; but there are instances such as the Roman Thermae or Baths of Rome, particular mention is made in a non-technical way to the system, the remains of which are founds in the Baths of Caracalla, here is found hot water and warm air heating, but note the difference from the methods employed to-day. The heated air was passed through a system of tile ducts under the floors, and did not enter directly into the room. The hot water was circulated around the rooms in open troughs covered with a bronze grating. These baths served the same purpose as our modern Turkish bath.

---

* Paper read before the St. John Professional Meeting of the Engineering Institute of Canada.

An extract from Architectural History on the Wonders of Roman Architecture regarding the use of Fountains, is quoted here. "Additional interest was given to the interior by the perpetual streams of running water issuing from the mouths of sculptured lions in marble or brightly polished silver falling into capacious marble basins and producing a delicious cooling effect in hot, sultry weather." The significence of this will be dealt with later.

It, however, remains to be said that the use of brassiers, burning charcoal was more generally the means of heating in cold weather. The remarks often made regarding raiment worn by these people refers only to that used while inside, when outside they clothed themselves with coarse heavy garments.

Referring to England in the 14th Century, mention is made of the open fire in the centre of the building in that part known as the "great hall," provision being made in the roof by louvers to carry off the smoke. Later on a greater increase of warmth was found necessary, as greater comfort was demanded, and the opening out of the coal industry, by cheapening fuel, led to each room having an open fire-place with chimneys, which later on became architectural features carefully treated. In the time of Elizabeth the great hall fire-place was richly carved with the coat of arms of the owner. For physicological effect, huge tapestries and draperies with their warm colors were hung about the walls, and, it is said, that in winter, straw or rushes were strewn over the floors of these great baronial halls.

It will be seen that the open fire has come down through all the ages and still plays a part even to this very day. Much sentiment is attached to this system of heating, the sole benefit of which is derived from the radiant heat of the fire.

Stoves made of cast iron on the principle of an open fire-place improved the effect by the addition of exposed heating surface, making the result obtained more economical and less wasteful.

The advent of steam, and the progress made in the last few generations, have made their demands upon all branches of applied sciences. The demand for more effective and more efficient heating and also the necessity of more applicable methods at the same time minimizing the fire hazard, has brought about the development of the various systems we have to-day. Their modern application is very recent, with rapid growth on more or less unscientific lines. Briefly and generally we make use of the elements of air and water.

The sun is nature's heating plant and accomplished all the things the ancient attributed to it. Man's substitute was the open fire. Your own observations of the effects derived are easily recalled. In both cases it is the application of direct heat of a radiant kind, so intense at times as to blister and burn the parts of the body exposed to it, yet with only minor effect on the surrounding atmosphere.

The systems of heating now involved in engineering problems and applied to our modern buildings are of a vastly different character. We use circulations of water, the vapor of water and air with the application of some of the basic laws of physics.

Applying heat to a building in these days is not only to keep body and soul together and supply warmth and comfort, but is in reality the attempt to create ideal summer conditions in winter. In fact we might god still further . . . rob winter of its cold and summer of its heat. In other words, producing an equable climate, conducive of the best results of maximum attainment or production with the minimum of stress and fatigue.

Benefited by the experiences of the past we have to-day efficient and rather wonderfully contrived systems of heating, vastly improved.

Many conditions arise that require special treatment. The adopting of any one particular system to meet all conditions is hardly practicable, therefore a study of the exact conditions as they exist, or may come into existence, is the first step in the design of a heating plant. We have for choice heating by hot water, by steam, or by warm air.

Hot water heating is divided into several classes, ordinary open tank gravity circulation, accelerated circulation by putting a system under pressure, and forced circulation by means of circulating pumps. The first is usually applied to residences or small buildings, the second is merely an attempt to create a more rapid circulation and extend the effectiveness to include a greater area. Each have their field, principally where constant heating is required. The wide range of temperatures, available in the heating medium, make these systems flexible enough to meet all the usual winter conditions, and when the piping system is properly installed, give good results. Of course, with such a slight force exerted it is necessary to keep well within the limits laid down by the laws of gravity. Forced circulation combines all the advantages of the ordinary gravity system and at the same time overcomes all the restrictions of the same. It has many commendable features, particularly flexibility, as the water temperature may be varied over a wide degree and even the circulation increased or decreased slightly making it further adaptable. The arrangement of the piping may be anything that will accommodate itself to structural conditions: pipe sizes are small and the radiating surface need not be so generous as in the case of the gravity system. It is a system well adapted to certain kinds of central heating as the grades of the piping can follow the natural grade. All special apparatus required, in fact everything except piping and radiators can be located in one point, at all times under the observation of the man in charge. Where the waste heat of exhaust steam is available, as is generally the case, it is used to heat the water and the condensation is returned to the boiler feed pump, without having to first travel all through the heating system and radiators. It obviates the necessity in underground conduits of having drips and drip trays at low points and inaccessible places. But, like all other systems, has disadvantages and limitations, it must be kept in operation constantly in cold weather to prevent freezing up at the most exposed parts.

The proportinating of the piping system for forced circulation of hot water involves a rather nice, intricate problem in hydraulics, the difficulty experienced is increased by the lack of data on the friction of small piping, steam fittings, valves, etc., at low velocity, all of which must be considered in order that the circulation be adequately equal to and well balanced with centrifugal pumps designed for the exact head, so as to operate noiselessly and without vibration. The motive power is usually direct connected steam turbines with the exhaust steam passed into converters and used to heat the water, a separate live steam heater being provided as a make-up when the exhaust is not sufficient and as a stand-by.

There are instances where the boilers are used as hot water boilers and the water circulated by motor driven pumps. There are also cases where the jacket water from large gas engines is utilized.

Regarding steam plants, there are also classifications. The simple one-and-two pipe systems, supplied direct from low pressure boilers, or from high pressure lines through pressure reducing valves, or supplied direct from the exhaust side of an engine. The principal weakness of these one-and-two pipe systems is the tendency of air binding and short circuiting, frequently causing the condensation to be held in suspension, giving rise to the annoyances of water hammer.

With the gravity return system, where steam is taken direct from the boiler and the condensation returned back by gravity, the boilers must be set low enough to give clearance between the water line of the boilers and the lowest point of the mains, sufficient to provide against flooding the mains by the deferentials of pressure between the flow and return.

With systems supplied through pressure reducing valves, or from exhaust, the condensation is usually returned, for economy to a hot well or receiver, to be returned to the boilers as feed water.

As mentioned before, air-binding is the chief difficulty. Steam will go anywhere it is piped, without much urging if the air can be easily displaced.

The systems just mentioned are dependent upon automatic air valves to vent the air from each radiator and other parts of the system. The best of these valves are delicate in their parts and adjustment, the orifices in some cases being as small as a needle and are easily put out of commission by the accumulation of dirt or grit, either from inside or outside the system. Two pipe systems with hand operated valves on both flow and return, are easily upset. If some person happens to close either valve and forgets to close the corresponding valve, in some cases requiring a complete shut down to allow the water accumulated, and held back in the system to flow out. Aside from hammering and banging in the system, these vents are liable to sputter and spit water occasionally, or hiss steam, to the decided annoyance of the occupants of the room. These conditions have been slightly improved by the use of an air line system in which all venting valves were coupled to a system of small piping and connected to a vacuum pump or exhauster, of which there are numerous types.

The more improved and the latest development are two pipe vacuum and vapor systems, in which each radiator is equipped with a radiator trap at the return end of the radiator which passes condensation and air only, into the system of the return piping, and closes against the escape of steam. Similar traps of larger capacity are provided to relieve the mains of condensation at the extremities and at intermediate points where necessary.

The most successful radiator trap is the thermostatic disc type, which is actuated by the temperature of the steam. The disc contains a volatile fluid especially compounded to respond to wide ranges of temperature and is hermetically sealed. The disc is always deflated when cold, so the trap is always open, except to the passage of steam.

Both vacuum and vapor systems are almost identical in design. Where the magnitude of the plant demands, the condensation and air are pumped out of the system, creating a low vacuum, making it possible in the case of exhaust steam heating to do away with any back pressure. In either case they are essentially nonpressure systems, as invariably the piping is designed for a deferential working pressure of from 4 to 16 ounces pressure. These plants will safely carry or operate up to 10 lbs. pressure, or will work on 8 to 10 inches of vacuum, but no advantage is gained; with the increased pressure, a slightly higher temperature is available, but only slight. With the higher vacuum, unless everything is absolutely tight, the vacuum pump is required to do the extra work of pumping the infiltrated air out of the system. Vacuum systems may be extended to include almost any number of buildings requiring to be heated from the one source and is easily made adaptable to overcome any conditions or obstacles. Its general use is the outcome of experience gained, and offers possibly the greatest opportunities of effecting the highest economies. One distinct advantage with vacuum or vapor systems is the fact that when the plant is not in operation no possible harm can be done to either it or the building by freezing up.

The first cost of installation is also in its favor.

We now come to warm water heating, laying aside the ordinary domestic installation, there is found in very general use, hot blast systems, in which the heated air is circulated by blowers. Examples of these installations are found in machine shops, foundries, roundhouses and other establishments in which there are tremendous leakages of air by opening large doors. There are, however, examples of blower heating systems, which have been brought to a very high degree of refinement, in which the air is carefully conditioned, all dust and impurities removed and a stated degree of humidity and temperature maintained under automatic control. These systems are applied to schools, theatres, auditoriums, churches, art galleries, etc., of the more expensive kind, as well as certain factories for special process work.

It may be said that for certain classes of work and certain conditions requiring to be produced, blowing heating offers the greatest advantages. For instance, in the Ford plant, the heating was accomplished by locating the apparatus on the roof with the ducts run along, branching off and passing down through the centres of the columns, discharging air through small openings for each floor, thereby occupying practically none of the cubical contents or floor space of the building.

By the use of air washers it is not only possible to provide clean, pure, humidified air in winter time, but it is also possible to cool the air on hot summer days, making the plant effective both summer and winter. This is particularly true in textile fabric weaving plants, where the necessity of a proper atmosphere brought about the development of the modern air washing apparatus, which, scientifically applied to some of the principles used by the Romans in their fountains. In the air washer, cooling by evaporation is the chief principle.

Time does not permit any lengthy discussion of any particular application of these systems. They are, however, intensely interesting and worked out on rather unique lines. The application of these systems require skilled judgment of a mature and well-reasoned kind being used in order that the economy and the best results are obtained. Combinations of this with other systems are frequently used to obtain certain results.

Modern building construction has undergone many changes of which you are all familiar. The following are brief comparisons of heat losses from various materials commonly encountered:

An equal thickness as far as possible has been taken to more readily compare the relative heat losses expressed in B.T.U.'s per square foot per degree difference per hour.

THICKNESS AND CHARACTER OF WALLS.

	(Factor)
12 in. limestone, furred and plastered	.52
12 in. standstone or concrete, furred and plastered	.47
12 in. marble or granite, furred and plastered	.40
12 in. marble or granite-hollow, furred and plastered	.30
12 ni. ordinary brick wall, furred and plastered	.30
12 in. ordinary brick, plastered on the brick	.29
12 in. ordinary brick, furred and plastered	.24
12 in. hollow brick, furred and plastered	.22
Brick veneer, sheating, studs, lath and plaster	.17
Frame, sheating, paper, clapboard, no plaster	.27
Frame, sheating, paper, clapboard, lath and plaster	.24
Frame, sheating, paper, clapboard, lath and plaster—back plastered	.21

MISCELLANEOUS.

3 in. slab of solid concrete	2.00
3 in. slab of cinder	1.00
3 in. slab of gypsum	.40
Glass	1.40

The above factors are compound factors and may vary considerable, for instance porous brick is by virtue of the confined air cells, a better insulator than the more solid and impervious material, but by absorbing moisture will materially change.

(*Continued on page* 24.)

Ideal Bread Company's Building, Toronto

In the matter of organization, or routing of work, the new factory of the Ideal Bread Company, Toronto, involved a problem which required special study. Besides this was the factor of providing adequate storage for flour and other materials used on a large scale in the making of bread, as well as the need of special sanitary considerations and the maintaining of constant temperatures in various of the departments where the mixing of ingredients and baking is done.

IDEAL BREAD COMPANY'S BAKERY, TORONTO.
SYDNEY COMBER, ARCHITECT.

The only special structural feature apart from the usual requirements is the heavy support or floor slabs carrying the travelling oven on the third floor. The building itself is of steel frame and concrete construction, five stories high and fire resisting in type. Windows on all sides adequately light the interior, the ceilings being lofty—in some cases 17 feet high. The interior of the walls are lined with hollow terra cotta blocks and finished in pure white Keen's cement throughout, with white glazed tile dadoes.

Practically all the entire ground floor is used for shipping purposes, the entrance for the delivery wagons being through seven large doors to a wagon area, which is arranged around the bread room located in the centre. This bread room is approximately 60 by 60 feet. In addition there is a receiving clerk's office and a large auto truck platform scale, which gives complete supervision and control and permits of the weighing and checking of all goods received for storage in the basement.

The basement which is used for flour and general storage purposes is very lofty and well aired. Special provision has been made in water proofing the walls and floors so as to ensure an absolutely dry interior. This floor is about four feet below the level of the sewer, but provision is made to effect perfect drainage. The basement also contains the boiler room, fuel bins, etc., a type of boiler being installed which, in addition to heating the entire plant, also provides live steam for use in manufacturing and baking the bread.

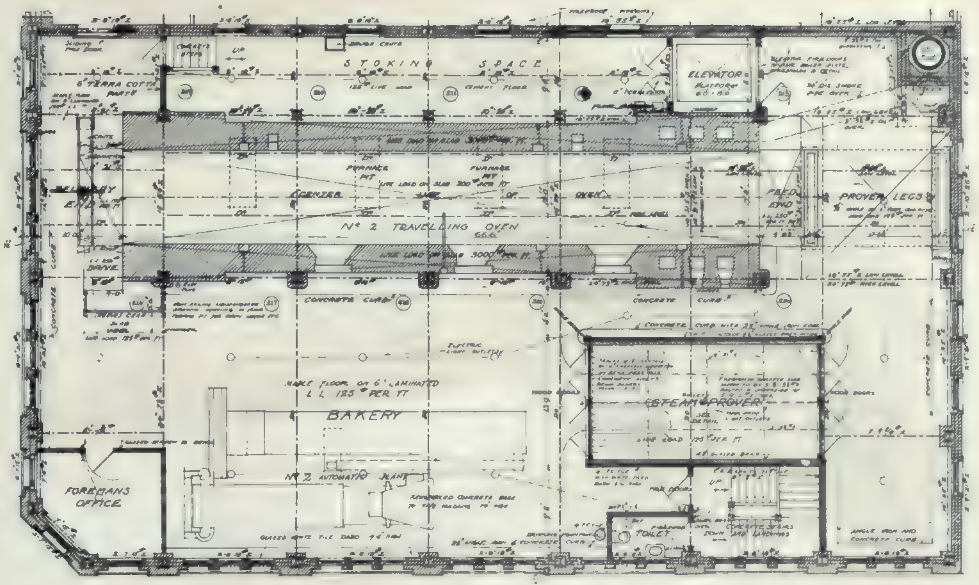
From the large bins in the basement where it is deposited after sifting, the flour is automatically lifted and discharged into weighers over mixers on the fifth or top floor. Here all the ingredients are prepared and discharged into huge mixing machines on the floor below. The water is brought to the right temperature for mixing in a 1,000 gallon tank.

The fourth floor is especially designed and used as a dough room and contains a battery of mixers and room for the great troughs in which the dough is deposited for several hours after mixing. Special humidifying apparatus is provided and a high and even temperature constantly maintained. The subsequent process of manufacturing the dough into loaves, as well as the baking of the bread, is done on the third floor, mechanical equipment being used throughout. A special feature is the huge travelling ovens of which there are two, weighing over 900 tons each. These ovens are seventy feet long and have a capacity of nearly 7,000 loaves per hour.

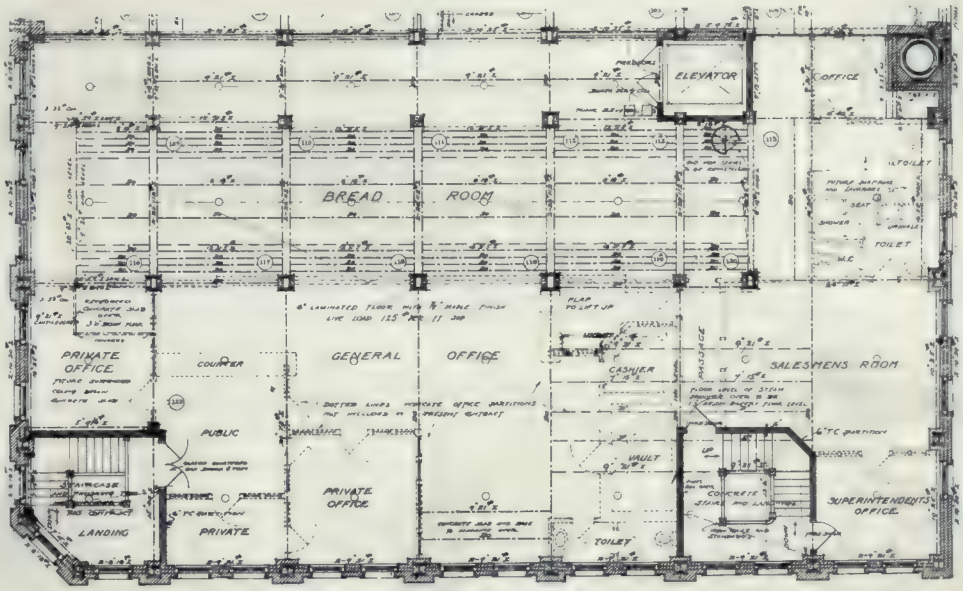
After the bread is baked it is carried by conveyors to the second floor where the wrapping, packing and cake departments are located, and thence to the shipping room in the basement. The second floor also contains the ovens and machinery for the making of rolls, buns, etc., as well as the general offices, superintendent's room and salesmen's offices which are accessible from both the main and the factory entrances.

The building is equipped with numerous drinking fountains, also lavatories on each floor, together with shower baths and locker compartments necessary in the interest of sanitation and for the comfort and convenience of employees.

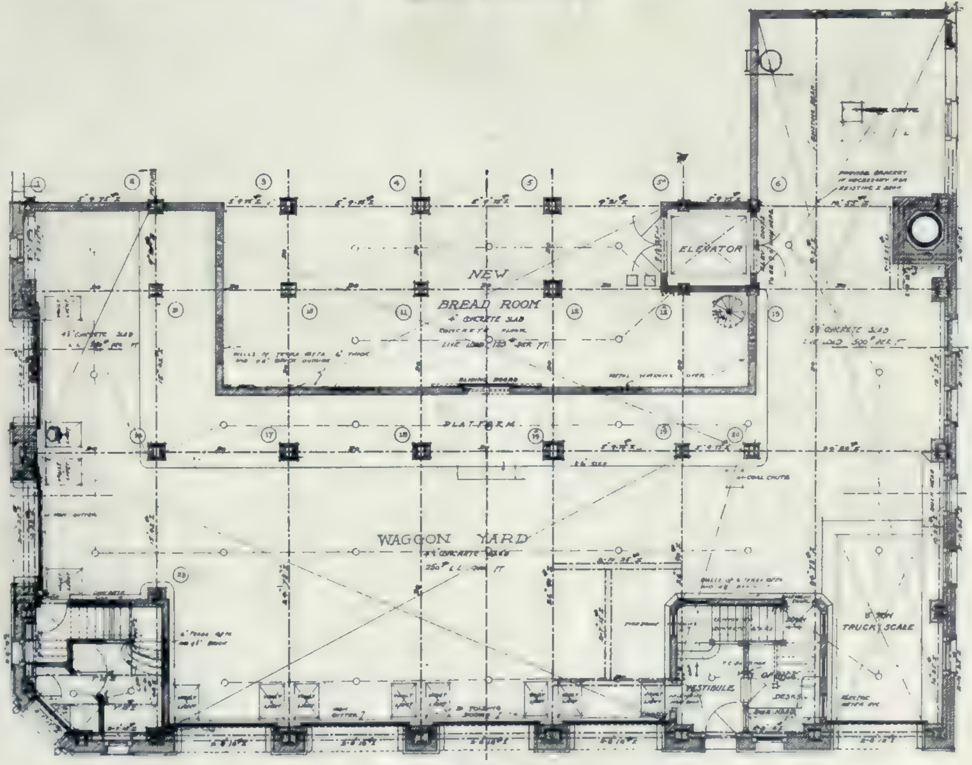
In addition to the mixing room, the fifth floor



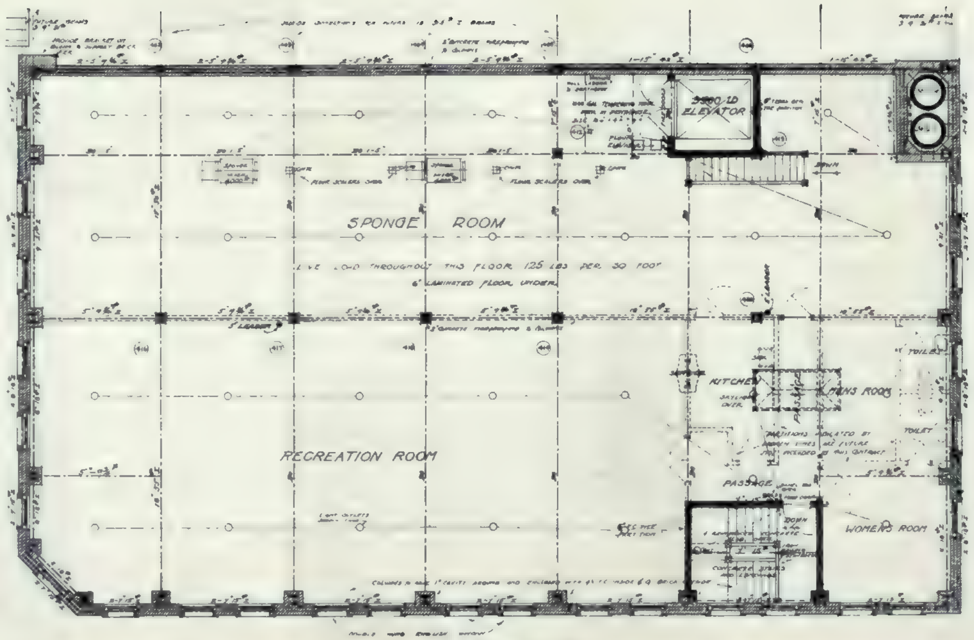
THIRD FLOOR PLAN.



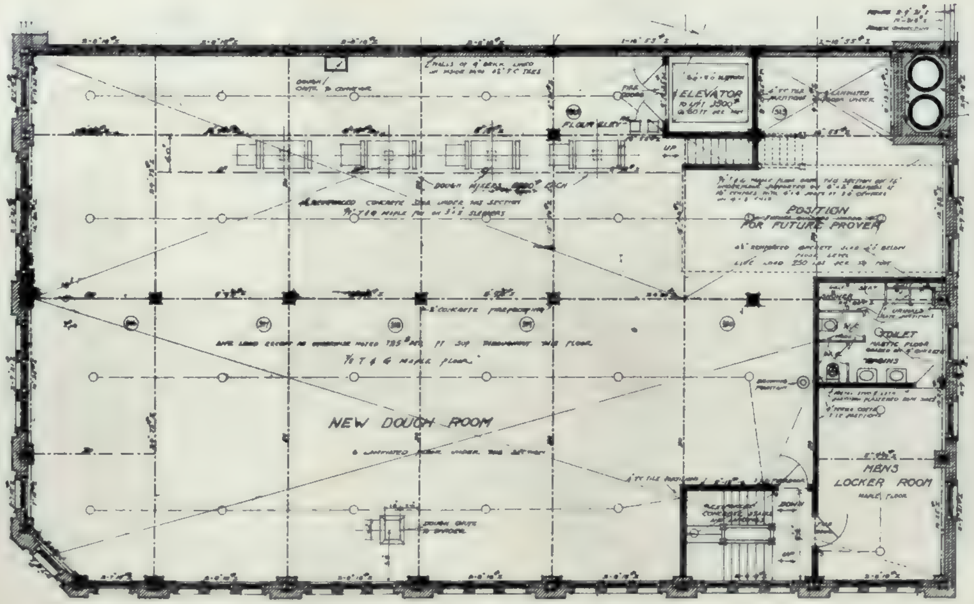
SECOND FLOOR PLAN.



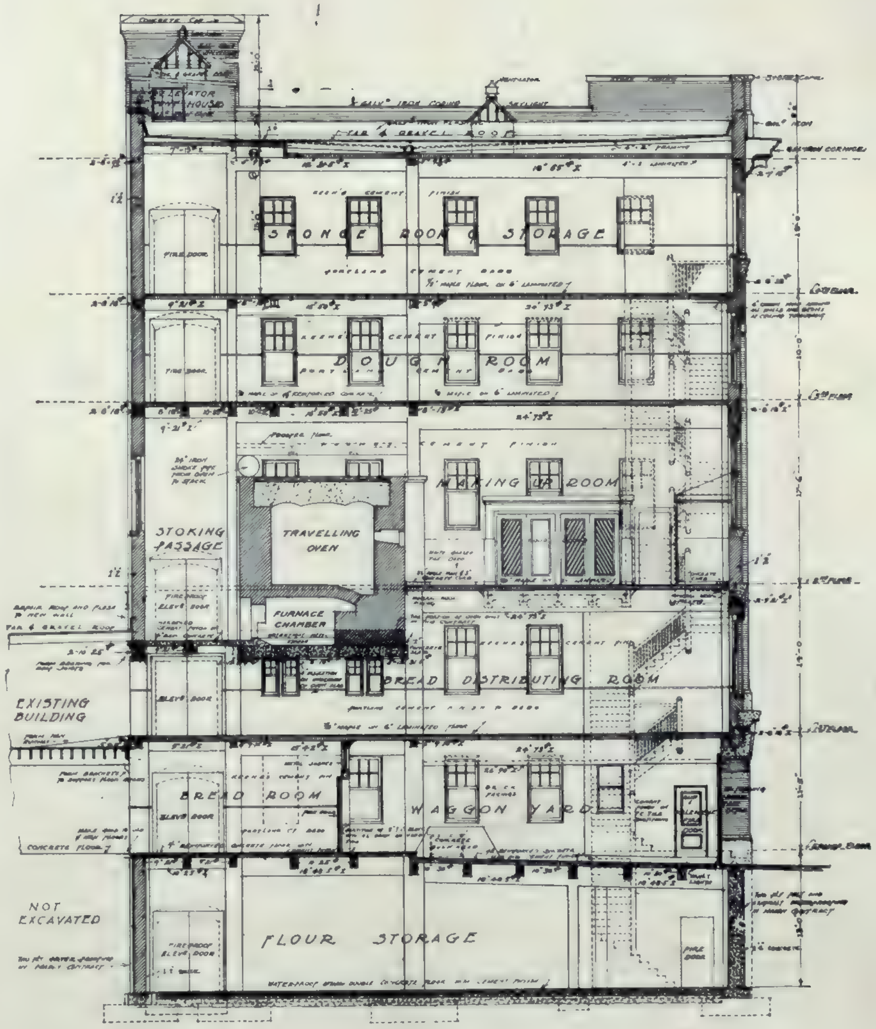
GROUND FLOOR PLAN.



FOURTH FLOOR PLAN.



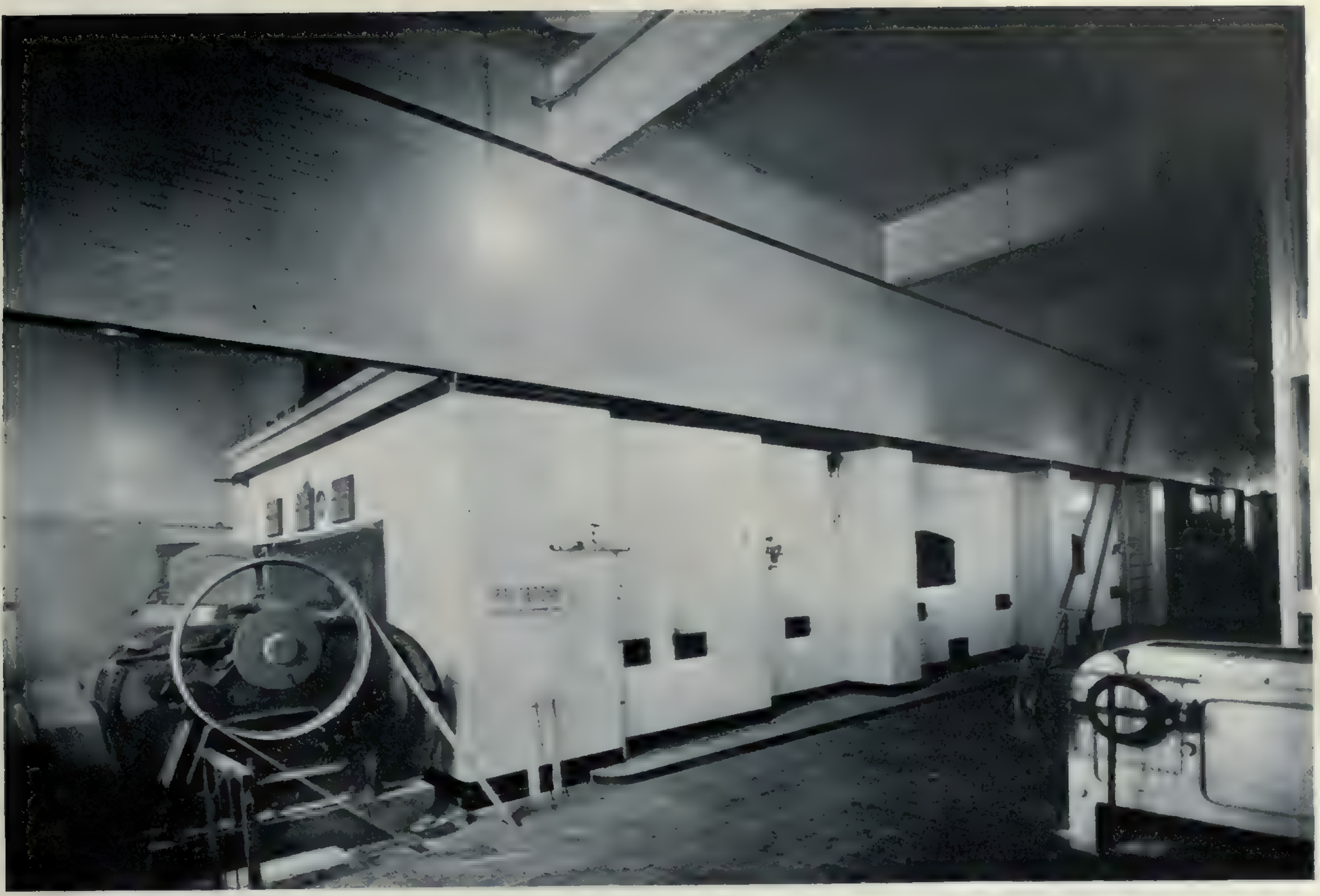
FIFTH FLOOR PLAN.



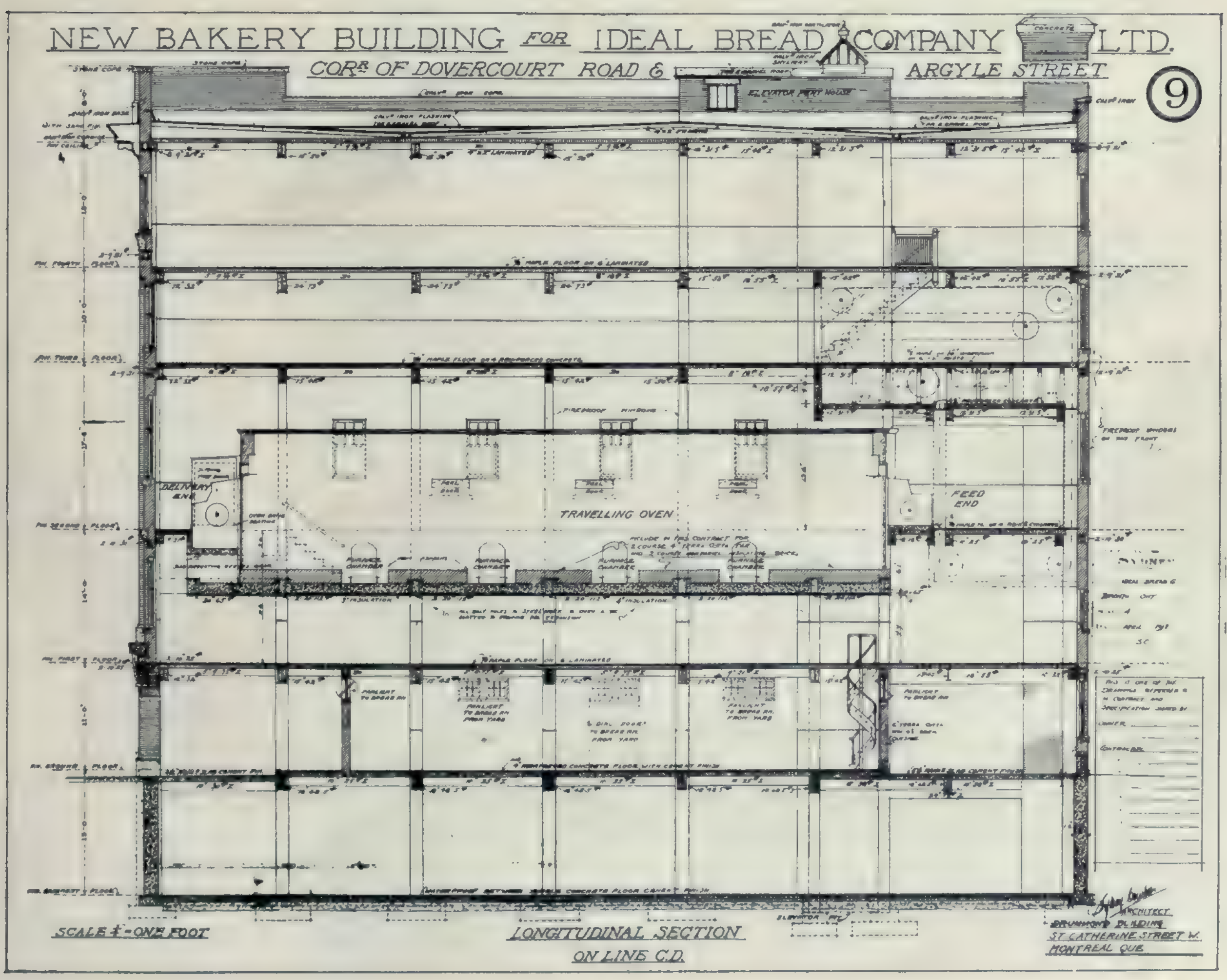
CROSS SECTION.

IDEAL BREAD COMPANY'S BAKERY, TORONTO.

SYDNEY COMBER, ARCHITECT.



VIEW OF TRAVELLING OVEN IN WHICH THE LOAVES GO IN AT ONE END AND COME OUT BAKED AT THE OTHER.



NEW HEAT TREATING BUILDING, DOWSLEY SPRING & AXLE COMPANY, CHATHAM, ONT.

contains a large assembly hall provided with platform, etc., and capable of seating 400. This is for concert and social entertainments which are held for the benefit of the employees and their families, certain evenings being reserved for the public when the plant is open to inspection.

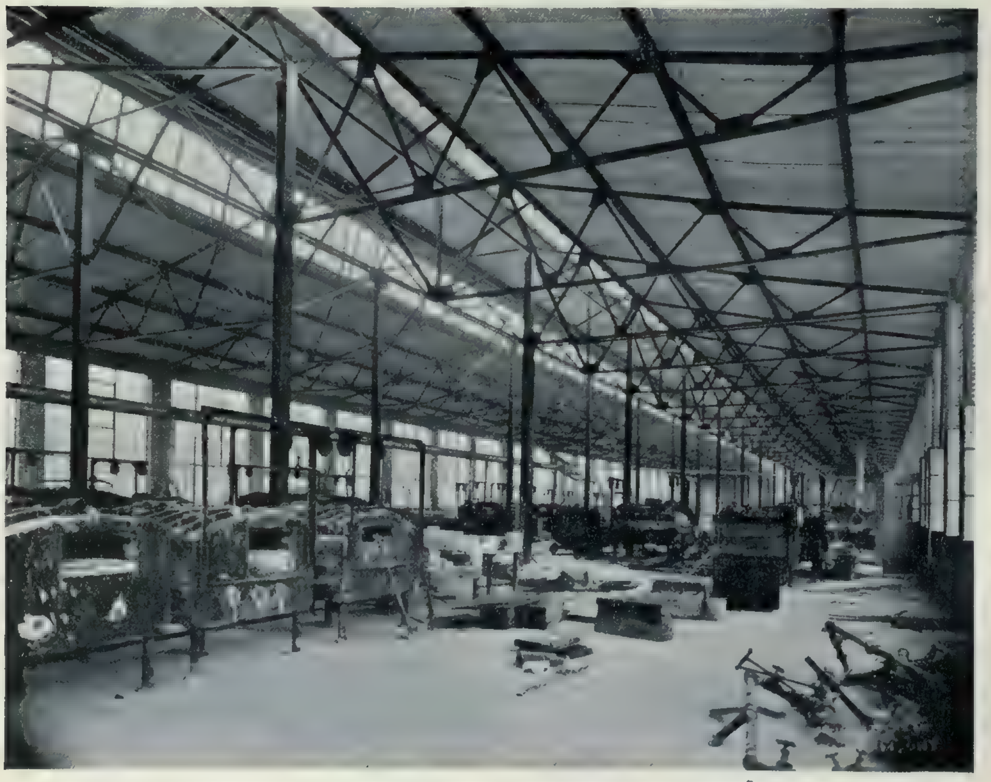
◆

Factory Rebuilt in 30 Days

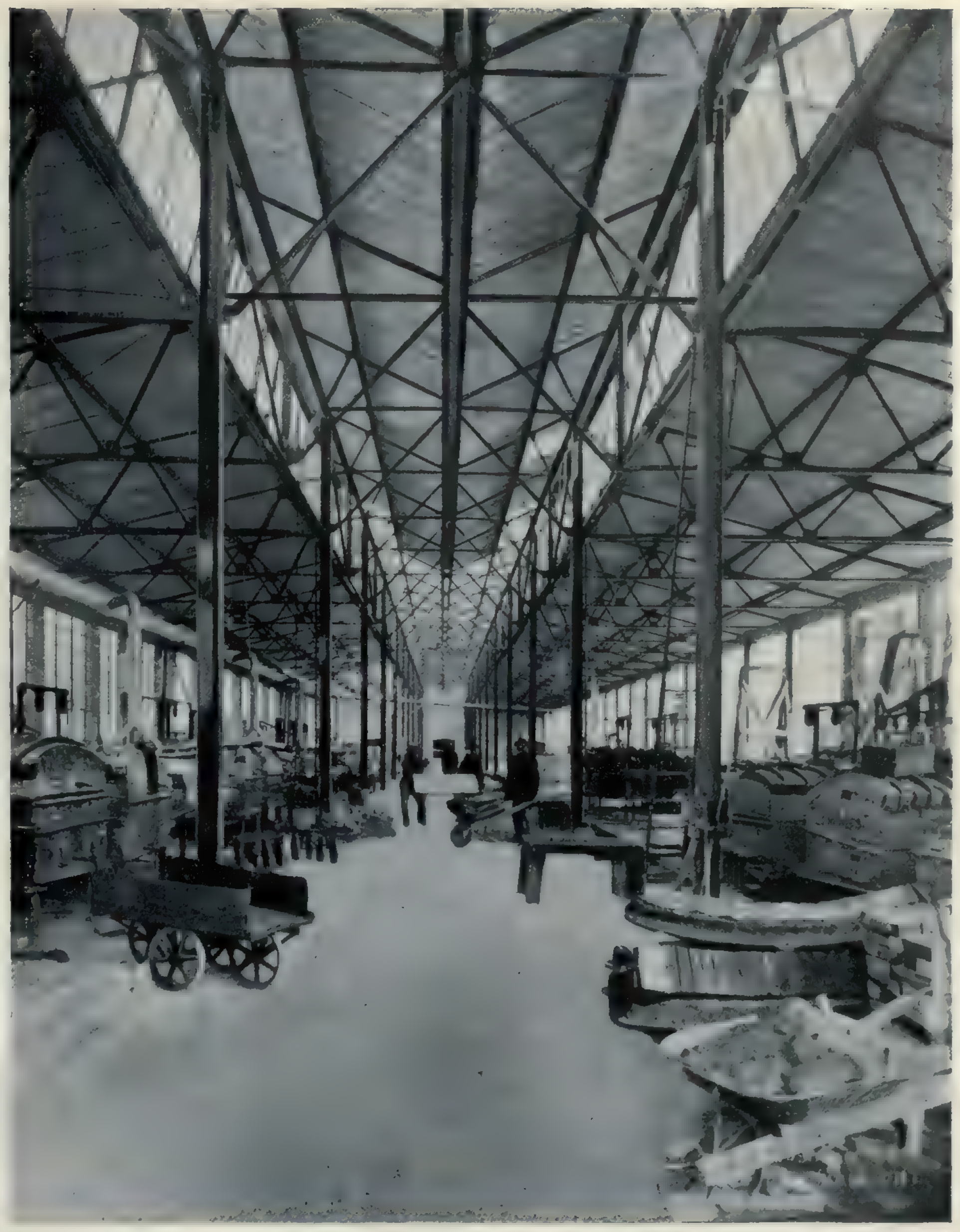
A very good record was recently achieved at Chatham, Ont., where a new factory unit was erected in 30 working days, following a fire on September 11th which destroyed one of the main buildings at the plant of the Dowsley Spring & Axle Company. The fire burned the original building to the ground and resulted practically in a total loss including most of the machinery. One of the oil tanks in the heat treatment section became ignited and the flames rapidly spread to the roof framing. Owing to the deposit of oil that had settled on the upper portion, the fire spread with great rapidity and was only checked by a fire wall towards the end of the building after the major part was destroyed and the walls pulled in leaving a mass of machinery, scarred building material and debris.

By working night and day shifts the Dowsley Spring & Axle Company were able to clear away most of the debris in rapid time. In the meantime architects were called in and co-operated with the officials of the company in making a new layout and designed an up-to-date fireproof one-storey building 75 ft. wide by 339 ft. long, agreeing to complete the structure in 30 working days.

The general layout and construction of the building is well illustrated by the accompanying photographs. A centre aisle of 15 ft. used for internal trucking determined the location of the centre columns, leaving a 30-ft. span on each side to the walls and the columns are spaced longitudinally about 28 ft. apart. Special care was taken to render the new unit a daylight factory and a comparison of the lighting of the new and old buildings on a dull day brings out the advantages of the former.



INTERIOR VIEW, SHOWING STEEL SUPPORTS AND ROOF SYSTEM.



DIRECT VIEW THROUGH THE DOWSLEY SPRING & AXLE COMPANY'S HEAT TREATING BUILDING

Owing to the large amount of gasses evolved from the furnaces, special attention was given to the ventilation and internal circulation of the air both in the location of the ventilators in the steel sash and in the location of the monitor ventilators, and also in the shape of the roof selected. The steel sash in the side walls are equipped with a complete run of vertically pivoted ventilators and also one large horizontally pivoted ventilator in each main section. The monitors are operated in 56-foot sections and admit of any combination with the side wall ventilators. This arrangement has proven to be very satisfactory.

The design of the steel framing is based on a patented system of roof trussing which effects a considerable saving in the steel construction. The roof is of gypsum block construction spanning about 6 ft. 6 in. resting on steel purlins. One of the features of this roof apart from its pre-eminent fireproof and insulating qualities is the speed with which it can be erected. The foundations are of concrete, the walls of brick and steel sash construction, the roof of gypsum block construction covered with a built-up asphalt roof, metal flashing, etc. The building has a structural steel frame and the floor of the building is of concrete containing trenches for the oil, water and pyrometer equipment. Up-to-date sanitary arrangements are also provided and the building is lighted with a complete conduit system of wiring containing special provision for night lights.

The agreement to provide the owners in 30 working days with a building to carry on the operations of making springs, was signed on September 15th, and on October 20th the company were manufacturing springs in the new furnaces of the rebuilt structure.

◆

Toronto starts off well—it is expected that permits will total over a million in January.

Canadian Co-operative Wool Growers Ltd., Warehouse, Weston, Ont.

The owners' problem was to get a good-sized building, basement and one storey, capable of having a second storey added. The situation had to be reasonably convenient to their head office in Toronto, it had to have direct rail connection, especially with the C.P.R. for receipt of wool from the west, as well as proper road connections for haulage by motor truck. Since raw wool i nbags gives only a light floor load even when piled as high as is compatible with easy handling, it can be safely put on floors lighter than the minimum allowed for warehouses under the usual city building by-laws. The result of these considerations was the choice of a site a short distance out of West Toronto, adjoining the C.P.R. right of way, and just at the southeast corner of the town limits of Weston. The site is irregular, the building is placed with its south side at the south line of the prop-

WAREHOUSE OF CANADIAN CO-OPERATIVE WOOL GROWERS LIMITED, (NEAR) WESTON, ONT. SHEPARD & CALVIN, ARCHITECTS.

erty, leaving space beyond, and next the C.P.R. for expansion, since a power plant and workmen's houses are contemplated.

The building is of simple slow-burning, mill construction type. The usual monotony of exterior of such buildings has been avoided by the piers, and by the shape and grouping of the windows. At one end is a ramp to admit of trucks being driven down from grade level into the basement. Along the north side is a loading platform, the main floor being at car floor height. An open roof covers the platform, supported on steel brackets from the wall.

The freight elevator has a platform 10 ft. x 10 ft., speed 40 ft. per minute. The stair enclosure is next the elevator shaft. The building is unheated except for stoves in the office space, cut off from east end of the main floor by a wood and glass screen.

The total area of the two floors is about 40,000 sq. ft., and the building cost complete with display signs, electric fixtures, and all other sundries, about ten cents per cubic foot. Excavation work was begun first week in April, 1919, and the building was occupied at the beginning of July, 1919.

◆

Sarnia to Build 600 Dwellings

It is reported that W. R. McEachren & Sons, Limited, Toronto, are organizing a syndicate to build about six hundred dwellings to relieve the present housing shortage at Sarnia, Ont. The project has the endorsation of the local Chamber of Commerce and work on the houses is to start early in the spring. During the past year the Sarnia Housing Commission expended about $70,000 in building twenty-two houses that cost between $3,000 and $3,200 each.

VIEW SHOWING OFFICE ENTRANCE.

Tapestry

Around Arras, in Flanders, circles forever the charm of pure beauty and stately majesty, although to-day the place itself is a dismal wreck. It is stated in a recent New Orleans paper that beauty and the charm of Arras lies in the one word "Tapestry." The first tapestries in Europe were made by Flemings, and made in Arras. Indeed, so noted were the weavers of Arras that the word itself became a synonym for "Tapestry." Shakespeare uses this in Hamlet, as when "Hamlet stabs Polonius behind the Arras," meaning the great curtain, or tapestry, hung in royal apartments.

The art of tapestry-making was first introduced into England in 1620, and introduced by William Sheldon. He established looms at Mortlake. Now, "tapestry" is the art of painting by the weaving of colored threads intertwined on lines stretched vertically (high-warp tapestry) or horizontally (low-warp) which become one web, combining lines and tones.

The skillful tapestry weaver is himself an artist; he interprets and he creates designs, called cartoons, which are the soul of his work. Tapestry-weaving was known to the ancients, to the Egyptians, and to Grecian women. Tapestries figure in Holy Writ. They were so costly that they could only be owned by kings.

The Saracens, or Arabs, who founded an Art, a Religion, and an Empire, introduced tapestry into Europe. The largest and most complete tapestry-weavings are the great textile pictures, or storied wall-hangings, of the fifteenth and sixteenth centuries, made in Arras and Brussels. The stories on tapestries ranged, in subject, from the Greek myths and gods to the doings of kings and to Scriptural subjects and lives of saints.

When the Spanish persecutions overflowed the Netherlands and Arras, tapestry-weaving was driven into France, where the Grand Monarque, Louis IV, a lover of splendor and patron of the arts, immediately purchased the house of Jean Gobelin, 1622 A.D., who was a genius in weaving, and the king turned the house into a factory, in which tapestries for the adornment of palaces should be made. Thus, the great name was born, from the name of their maker, for the noblest tapestries in the world—the Gobelins.

One century earlier, in 1519, the Pope Leo X paid from the Vatican Exchequer, one thousand pounds each for the ten cartoons to Raphael, to be copied into a tapestry.

Spain to-day owns the incomparable collection of Arras Tapestries, thus Arras is immortal, for her heroes and her art.

A WAREHOUSE BUILDING.

—*Reprinted from American Architect.*

POWER HOUSE.

The Draftsman

Address given before the Draftsmen's Association of Toronto, by Chas. S. Cobb, Architect.

THE world of building, construction and engineering owes a great debt to the draftsman. The man who through long hours pushes the pencil and guides the tee-square working out the intricacies of detail upon which the success or failure of some great building, or some great bridge, or some huge dynamo, depends or perhaps only twirling circles which indicate the rivets in an I beam, performs a vital function in the society of to-day.

The architect, the engineer, the builder could do nothing without the draftsman. The mason, the carpenter, the steel worker, the foundryman must all be guided by the knowledge, the skill, the discernment of the man in the office who, first poring over his drafting board, has thought the way through on paper and sounded the unknown sea and charted with certainty and precision the way to produce and assemble all of the intricate parts which go to make up the complicated engineering or architectural structure, or some complex piece of almost super-human machinery.

Any agency which will assist the draftsman to become more proficient in his work, to stimulate him to self-development, to raise him out of the hum drum of office routine, to increase earning ability, to improve his relations with his employer and his associates, and in short make his daily life broader, richer, more interesting and agreeable, deserves the support of all interested in the noble profession of construction be it architectural, civil or mechanical engineering or any of the allied callings.

It is with this idea in view that I welcome the opportunity to address this gathering of draftsmen in an effort to add some small portion of support, interest and sympathy for your movement.

"Esprit de corp" is the French word for "spirit of the company" or team work. No more valuable asset can be had for any office, architectural or engineering, than this. It means loyalty, co-operation, perhaps personal sacrifice for the good of the group.

As Kipling said:

"It ain't the guns nor armament
Nor funds that they can pay,
But the close co-operation
That makes them win the day.
It ain't the individual,
Nor the army as a whole;
But the everlastin' team work
Of every bloomin' soul."

The ideal of every office should be to develop a high spirit of pride in its work, and everything that tends to maintain and improve that position before the public. Let no draftsman think, no matter how simple his duties may be, that his work is lost in the fabric of his office's product. The total is a collection of individual efforts and all contribute surely and certainly to success, mediocrity or failure.

In a recent trip to Detroit I went through a great automobile plant, and there I followed the rough castings, entering at one end of the plant, through operation after operation, a hole being drilled here, a bolt fastened there, always progressing and developing and changing from the crude elemental materials until finally the finished chassis of a truck emerged complete, ready for service, from the end of the plant. A thousand hands had added their quota of human effort to make this almost human piece of machinery. It was a beautiful illustration of team work and a wonderful example of co-operation with the draftsman as no small element in the ultimate result.

It is team work, co-operation, collective effort and understanding that makes the complex life of to-day possible, and happy the drafting office where such co-operation exists.

What should the employer, employee and public expect from each other?

The employer expects to get from the employee: service, economy of effort, efficiency, speed, loyalty, co-operation, team work "Esprit de corp," good workmanship, cheerfulness, energy, initiative, willingness, good habits and resulting good health and efficiency.

The employee expects to get from the employer: a good wage, an increased wage for increased service, good working conditions, appreciation, consideration, opportunities for advancement and improvement.

The public expects to get: Service at as reasonable a cost as possible; efficiency, speed, co-operation and a fine regard for the owner or buyer's interest.

The draftsman of to-day will be the architect or the engineer of to-morrow. This is inevitable. The offices higher up must and will be filled from the ranks. The race is to the swiftest, and eduction, efforts for improvement, conscientious execution of each day's duties, is the only sure way for advancement. Luck cuts very little figure in this world. As Thomas Edison has aptly said, "Success is one-tenth inspiration and nine-tenths perspiration." Personal development is the one sure way toward a betterment of your position in Life. Development of oneself produces something which no one can take away and the frame of mind that can laugh at fate.

If one of the main objects of this organization can be made the stimulation of all means toward the mental, moral, and physical improvement of its members, it will indeed perform a function and in my mind go a great way toward the achievement in a constructive way of its aims.

For the architectural draftsmen may I suggest the "Atelier" as a possible assistance toward improvement.

"Atelier" is the French word for studio. In Paris it is the Atelier system through which students in architecture are trained. Various ateliers under the supervision of eminent architects carry on their activities independently, but are all under the control of the Ecole des Beaux Arts, or College of Fine Arts, which issues all the programmes for the student problems and conducts the judgment of the problems after the drawings have been received from the various ateliers.

The "Atelier" system was introduced into New York City some years ago by prominent architects, many of them graduates of the Beaux Arts in Paris, as a means to stimulate architectural education among draftsmen, especially those young men of ability to whom had been denied the opportunities of college or technical school education. The success which has attended these efforts has been outstanding.

At present in Toronto means of education outside the University are practically limited to what can be picked up in the architectural offices of the city. Some offices offer considerable advantages and encouragement of such student effort, others disrgeard it entirely and depend largely upon the daily work in the office to produce the desired development. The great benefit which an atelier could effect in Toronto would be the bringing together of draftsmen from different offices with varying degrees of ability, and by problems solved by them together would through the resulting stimulation, or, as the French call it, "emulation," produce development and advancement which could hardly be possible if the draftsman had to depend upon his own detached and separate effort.

A room in the down-town section, properly heated and of sufficient size, would be required with some simple equipment in the way of drafting tables and boards. Practicing architects could undoubtedly be persuaded to give periodic criticisms of the work and act as committees of judgment. This would have the two-fold benefit of bringing the draftsman before the architect in an informal way and of placing in a most favorable light outstanding ability, and would result in mutual advantage.

Efforts to improve the wage conditions should form a very important function of such an organization as this. Some draftsmen in the past have not been paid as much as they should, a few perhaps have been paid more than they really earned. Any efforts which tends to determine just what draftsmen should be paid in relation to their varied stages of proficiency, should be welcomed by both employers and employees.

A draftsman like any other worker must produce in saleable goods: (1) enough to pay his wages; (2) enough more to pay his proportion of "overhead," which means office rent, supplies, stenographers' services, taxes, interest on investment in plant, etc., etc.; (3) still some more in the way of profit for his employer. Unless he does at least these three essential things he is not holding his end up and cannot hope for advancement. His ability to produce in excess of his wages depends entirely as to whether his wage will be increased.

The surest and best way to bring this about is by increased skill through education, reading, self help and development. This is the constructive way, the sure way, and the satisfactory way. The efficient man is seldom neglected in business life; he not only grasps opportunities as they are presented, but makes opportunities and see that he is prepared to make the best use of them.

This Association is a good thing. The architects have their societies, the engineers theirs, and certainly the draftsmen should have an association. We hear a great deal these days about strikes—whole section of workers collectively refusing to work unless certain conditions are complied with. I have no doubt that the strike has been in many cases the only resort, and has often obtained important results which would have been secured much more slowly by less drastic means. Then, again, we see strikes inflicting great hardship on the public at large, and others failing completely after causing their participants hardship and loss of earnings. Wages have undoubtedly been raised in some instances by the agency of the strike, only to be passed back again to the consumer in vastly increased cost of commodities.

This organization could undoubtedly employ this means toward improving the condition of its members from a wage standpoint, but I mistake the intelligence of the members, if they cannot see a more constructive way, and that is the devising of means of increasing the individual abilities of its members, and through increased service secure in the one sure way an ultimately increased reward. This is the constructive way.

You can adopt the slogan of the "Union," or you can seek the ideals of a higher craft, a "Draftsman's Guild," perhaps, whose leaders can see that service, efficiency, devotion to the high ideals of better craftsmanship, better understanding of the problems of each one's job; that that is the one sure way toward permanently and constructively improving your conditions collectively and individually.

Heating Problems Produced by Modern Methods of Building Construction

(*Continued from page* 13.)

Confined dry air is the best insulator as for example the best commercial pipe covering for steam piping is 85 per cent. magnesia, because of the large percentage of minute air cells held in suspension and unable to circulate.

In working out the details of a heating system, it is first necessary to ascertain the heat losses from the various rooms or apartments to be heated, and apply the proper amount of radiating surface to offset the loss for a stated set of conditions, which are usually determined from the local conditions or requirements.

To attempt to give any arbitrary rule is entirely out of the question, as it would prove more misleading than enlightening. There is, however, this statement to be made in the interests of economy:

All buildings constructed of such materials as are subjected to heavy transmission losses, must be very thoroughly insulated, otherwise the effects on the occupants subjected to the artificial atmosphere produced, often overlooked and not easily understood, is detrimental even beyond our recognition.

The characteristics of the present systems of heating are of an entirely different nature to the radiant heat derived from the open fireplace. With the open fire, as before mentioned, the heat is of a radiant kind, but with direct radiation, in either water or steam heating, the heating effect is derived entirely from the circulation of air collecting the heat from the radiators by convection.

There is a physiological side which must be considered, produced by prevailing conditions, often causing severe strain and enervating fatigue. The purpose of the atmosphere is to keep our bodies in a state of health and aerate the blood. The food we eat is chemically changed by the various processes, and with every chemical action heat is generated and the body must lose this heat, if the normal blood temperature is to be kept constant.

In the opening paragraphs of this discourse mention was made of the extremes of heat and cold, not unusually met with, yet the temperature of the blood remains absolutely constant when a person is in good health.

There is spread over the whole surface of the body, an elaborate nervous system, which nature has saddled with the responsibility of maintaining an absolutely constant blood temperature. The body loses heat by conduction, radiation, evaporation, as well as small quantities carried off by breathing and the moisture contained in the breath.

Nature has placed in the atmosphere three physical functions, namely, temperature, humidity and movement of air, which are the all-important factors, and it is only when we seriously disturb any one of these three factors that we experience trouble, and if persisted in, causes a breaking down of the human system, giving rise to serious disorders. For instance, if a person is so placed that the body is unable to be cooled by the presence of an envolope of stagnant air, the sun's rays will quickly produce sun stroke or heat prostration. In certain cases, under similar conditions, the heat from an open fire place will produce the same effect in a more modified degree.

In order to better understand the effect of the physical properties of the atmosphere, let us examine the chemical characteristics as related to bodily health and comfort. It is necessary to have a clear understanding of the process of respiration or breathing and the changes which take place in the air in the respiratory tract—At the beginning it should be clearly under stood that the lungs are never filled with pure air, even under the most favorable conditions, because breathing is only a frequently repeated slight dilution of the air remaining in the throat and larger bronchial tubes after expiration.

The air that is exhaled out of the lungs after being mixed with a certain proportion of outside air is again drawn into the lungs as a mixture which does not even remotely approach chemically pure air. This results in making respiration a continuous instead of intermittent process and so provides for a constant supply of oxygen, necessary to the life of the tissues.

It will be seen that any changes in the proportion of oxygen and carbon dioxide, which is likely to occur in the air of a poorly ventilated room will have no appreciable effect upon the air within the lungs.

Pure outside air is a mechanical mixture of oxygen and nitrogen with traces of CO_2. The oxygen content is about 21 per cent. and hardly ever falls below 20 per cent. in the poorest ventilated rooms. As air in the lungs contains about 16 per cent. oxygen under normal conditions, it is evident that any changes which may take place in the oxygen content of the surrounding air will have but slight effect internally. Furthermore, the supply of oxygen in the lungs is not dependent upon outside conditions, but is regulated by the amount of carbon dioxide dissolved in the blood, and this in turn acts upon certain nerve centres, which control the depth and rate of breathing. If the carbon dioxide falls too low, stimulation of the nerve centres ceases, and the process of respiration does not take place till the proper proportion has again been accumulated. The normal proportion of carbon dioxide in the air of the lungs is about 5 per cent., and is automatically kept at this point by the action of breathing.

Under these conditions the effect of impure air, so called, is an unnoticeable increase in the action of the lungs through faster and deeper breathing; thus, the function of breathing is dependent entirely upon internal rather than external conditions.

The evil smell of crowded rooms has long been accepted as proof of the existence of harmful poisons; as a matter of fact, such odors come from secretions of the skin; from food eaten, decayed teeth, foul breath of dyspepsia, soiled clothes, etc., etc. While such a mixture of odors is offensive and disgusting, it has been proven to be harmless in so far as its direct effect upon health is concerned.

Recent investigations show that the effect usually attributed to foul air and poor ventilation is due to the physical condition of the air rather than the chemical condition.

As mentioned before, the body must be relieved of the heat produced and experiments show that an ordinary adult will produce, and must be relieved of enough heat in the course of an hour to raise one thousand cubic feet fifteen or twenty degrees. This heat is constantly carried away from the body, partly in the air exhaled, but chiefly through the skin by convection, conduction and evaporation of perspiration. It is evident that the prompt removal of this heat will depend very largely upon the atmosphere surrounding the body: upon the temperature, humidity and the movement of the air.

The physiological effect upon the human body of over-heating is a derangement of the vaso-motor nerve system. For example, a cool wind striking the skin will stimulate through the sensory nerves, the vaso-motor nerve constrictors, which in turn cause the small vessels near the surface to contract and drive the blood deeper in the tissues and so preserves the bodily heat. A warm wind or other source of external heat causes dilation and draws the blood to the surface, thus cooling it more rapidly. It will be seen that with no two human beings alike, with the complicated and intricate nature of the human body, the strain and nerve tension of some classes of work, the tremendous variations, etc., etc., lead us to believe that we are up against hopeless conditions in attempting to produce ideal summer climates inside during winter weather.

Humidity has a decided effect upon conditions. Too much humidity accompanied by a high temperature, will retard the cooling of the body, as is usually the case in a poorly ventilated room, and becomes doubly harmful because of the combination. You have probably observed women in an overcrowded theatre with the temperature high, gasping for breath and almost fainting, fanning themselves to overcome the effects and bring relief (temperature, humidity and movement of air again.) Women, on account of an extra layer of fatty tissue, which nature has omitted from man, will show signs of distressing conditions more rapidly than men in the above instances, yet will feel quite comfortable outside, with much lighter clothing.

Due to the alteration of the percentage of humidity in the air in a heated room, a perceptible movement of the air will cause a heavier convection loss from the exposed parts of the body, which frequently causes congestion or colds, due to the uneven cooling of the body. Yet these conditions could be magnified many times in a natural atmosphere where nature has compensated the temperature and humidity, with the opposite effect and pleasing sense of exhiliration. Such, for instance, as driving in an open automobile.

We are confronted with these facts that the remedy is an exact knowledge of all the factors entering into the problem, not separately, but as a co-relative and collective whole, and what relation each bears to the whole. In this there is room for some valuable research work.

Possibly the best summary of this paper will be to examine in what manner of means does the construction of our modern buildings effect the occupant.

In the present day, we have some wonderful buildings and further heated by systems the very acme of mechanical perfection. The builder is justly proud of his accomplishment, the engineer has achieved success in the application of mechanical skill, yet that human element frequently called the "Layman," having to perform the daily task of living and working in the atmosphere enclosed by the building, is frequently far from satisfied. Call up to your mind those constant and familiar remarks from all sources and all kinds of people, heard on every side; these questions are logical, but have we the answer ready? It is feared much must be gone through before the answer is unfolded. Let us analyze briefly the room in which this meeting is being held. It is easy to imagine a condition to begin with, where the temperature inside and outside are equal, the walls and windows are neutral, and there is no transmission of heat: now follow the action as the outside temperature drops, a loss of heat is caused inside as well, the walls transmitting the residual heat to restore the balance inside and outside: as the outside temperature keeps dropping a point is reached where, in order to be comfortable, we must resort to supplying artificial heat. Let the outside temperature keep on dropping, we simply supply more artificial heat to maintain the comfortable temperature inside; as the difference between the inside and outside temperatures increases, so is the heat loss increased in a slightly greater proportion, the amount lost has to be added by artificial means.

The walls, windows and other surfaces of this room exposed to the lower temperatures, are the barriers purposely constructed to conserve the heat loss and upon the character of the construction will depend the amount of heat that will be required to maintain the comfort zone inside.

In addition to the heat loss another factor is encountered, namely, infiltration of outside air increasing as the temperature outside drops, displacing air already heated with air requiring to be heated.

These are the factors commonly treated to determine the size of the radiators, glass, wall and air changes. Incidentally a room of this character would have, in winter weather, a complete air change, due to infiltration directly, and from other sources, of approximately once every thirty minutes.

In the process of off-setting these heat losses the cubic contents of the room in the air contained, must carry the heat content necessary to provide for the loss and leave, as a net result, the desired temperature for comfort, usually measured five feet from the floor (the breathing line) at a point near the centre of the room, where the average will prevail.

It is easy to imagine still further what the result will be if the barrier between the inside and outside be rendered less effective by increasing the glass area and decreasing the insulating qualities of the wall construction; greater heat must be added to the cubical contents to supplement the extra loss; getting further away from natural atmospheric conditions.

The excessive heating required to meet some of the conditions becoming more common every day, causes a rather serious dispersal of the humidity contents, and this tendency leads to nervous irritability, lassitude, dryness of the throat and nasal passage, additional strain on the glands secreting moisture, also the effect of decomposing the organic matter in the air, giving it that dry, burnt, stuffy sensation; also natural dust robbed of the neutralizing effect of the humidity causes irritation.

The amount of moisture contained in a natural atmosphere of 70 degrees, is generally about 5 to 6 grains per cubic foot, corresponding roughly to 50-60 per cent. saturation. The amount contained varies considerably, at 32 degrees, for instance, 100 per cent. saturation will give only 2 grains per cubic foot, and at zero only .5 grain, so that with air at 30 degrees outside and a natural humidity of 60 per cent. the effect of heating this air up to 70 degrees reduces the humidity to about 15 per cent., or less than the dryest climate known.

The variations in humidity give rise to the sensible temperatures registered by the body. It has doubtless been observed that certain rooms are comparatively cool at a high relative temperature, while other rooms are warmer at a lower temperature. On examination the psychometric chart, 58 degrees at 60 humidity corresponds to 75 degrees at 30 per cent. humidity, both of these would maintain the same sensible temperature as far as the body is concerned.

The deduction resolves itself into this: If the character of the exposure and construction produce high transmission losses, we depart far from the natural conditions; the comfort zone creeps higher up the scale, necessitating higher inside temperatures being maintained, increased cost of heating plant, increased expenditure of fuel.

If in designing and constructing our modern buildings, more thought be given to the insulating qualities of the materials used, and even if, in the choice, the first cost be slightly increased, there will be good returns on the extra outlay. It will be saved in plant, fuel, etc., and at the same time the effect upon the artificial atmosphere will be less drastic, adhering closer to the natural, lessening the physical strain of adjusting ourselves to the conditions that must of necessity be produced that we may carry on.

These remarks are directed particularly to the industrial situation, as there is an earnest desire on the part of everyone to create better working conditions.

The human factor is the vital problem, produced by some of the methods of modern building construction.

In olden days the construction of buildings, and even the furnishings, were made to accommodate themselves to the heating and the limitations were recognized. In these days, in many instances, no thought is given to the various phases of the conditions produced and very sketchily outlined herein.

This subject is very deep, covers a broad field; any part of which would readily enlarge itself into a subject of its own.

◆

Ontario to Build 5,000 Houses Under Housing Act in Spring

Over sixty municipalities availed themselves of the advantages offered by the Ontario Housing Act during the past year. About 1,500 houses in all have been under construction, including a considerable number which have already been brought to completion. The loan for these amounted to between $4,000,000 and $5,000,000. According to a recent issue of the Public Service Bulletin, the plans of these various municipalities for next spring contemplate the construction of about 5,000 more houses. In all it is probable that the Province will be asked to spend $20,000,000 by the end of 1920.

CONSTRUCTION

A · JOURNAL · FOR · THE ARCHITECTURAL
ENGINEERING · AND · CONTRACTING
INTERESTS · OF · CANADA

H. GAGNIER, LIMITED, PUBLISHERS
Corner Richmond and Sheppard Streets.
TORONTO - - - - CANADA
M. B. TOUTLOFF, Editor

BRANCH OFFICES:
MONTREAL—171 St. James Street,
E. R. Milling, Representative.
WINNIPEG—336 Qu'Appelle Street,
F. C. Pickwell, Representative.
NEW YORK—505 Fifth Avenue.
H. M. Bradley, Representative.

CORRESPONDENCE.—All correspondence should be addressed to "CONSTRUCTION," Corner Richmond and Sheppard Streets, Toronto, Canada.

SUBSCRIPTIONS.—Canada and Great Britain, $3.00 per annum. United States, the Continent and all Postal Union countries, $4.00 per annum, in advance. Single copies, 50c.

ADVERTISEMENTS.—Changes of, or new advertisements must reach the Head Office not later than the twentieth of the month preceding publication to ensure insertion. Mailing date is on the tenth of each month. Advertising rates on application.

CONTRIBUTIONS.—The Editor will be glad to consider contributions dealing with matters of general interest to the renders of this Journal. When payment is desired, this fact should be stated. We are always glad to receive the loan of photographs and plans of interesting Canadian work. The originals will be carefully preserved and returned.

Entered as Second Class Matter in the Post Office at Toronto, Canada.

WESTON WRIGLEY, Business Manager
FRED. T. HOLLIDAY, Advertising Representative

Vol. XIII Toronto, Jan., 19 No. 1920

Toronto Live Stock Arena

The ratification of the Live Stock Arena by-law by the ratepayers of Toronto again brings to the foreground the question of a comprehensive plan for all future buildings and improvements at the Canadian National Exhibition. It would indeed be a mistake to set down the building or to design the structure without due regard to the relation it will bear architecturally to future buildings and improvements. It is rather to be hoped that the new arena, which will cost one million dollars, will form the nucleus of an ultimate scheme reaching a dignity and composite character equal to the distinction and prestige which the exhibition has won as the greatest annual event of its kind. The opportunity which presents itself is therefore one which should not be neglected. The citizens of Toronto have provided generously for this building, and they have every reason to expect that in the matter of design it will be given the best expert attention. The arena itself will be utilized for a number of purposes. Besides providing facilities for the judging of live stock, it is also to be used for athletic events and conventions. It should therefore represent an important unit in the contemplated scheme of expansion which is at present under consideration. As the Toronto "Globe" editorially points out, the Exhibition Board would do well to take counsel with competent professional advisers before proceeding with any extensive rearrangements of the exhibition grounds.

◆

O.A.A. Council Meeting

At a meeting of the council of the Ontario Association of Architects on January 6, it was decided to take up the matter of revising the present schedule governing charges for plans by members of the Association. Response to a letter sent out by President Herbert E. Moore showed the question to be one of general interest and resulted in a committee being appointed with instructions to submit a report embodying recommendations at a subsequent meeting. Several applications for membership were also considered, Messrs. Chris C. Thompson, D. S. Cameron, R. W. Catto, and Benj. Brown being admitted as associates.

◆

Building Costs

Building costs have recently been the subject of a certain amount of newspaper comment which might lead to the inference that the price of materials has taken an unprecedented jump. Such, however, is not the case. The rise in the cost of building materials has been gradual and less precipitate perhaps than in any other line, and any recent advance is due to economic changes which under existing conditions cannot be avoided. In fact there is no valid reason why any owner should not go ahead with contemplated work. He will certainly pay more than in the pre-war period, but he will in all probability pay it with less hardship than at that time. The crux of the situation is simply this: Wages are high, commodities are high, and the earning power of the manufacturer, business man and labor are on a proportionate basis. In other words, earning power and prices have remained relative.

By the same token present investments will not be seriously affected by any subsequent change, so that the owner who builds now even if prices and value decrease is not going to find himself any the worse off. It simply means that he bought at the relative value of the dollar, and that any decrease which might come (and this is as yet a remote probability) must necessarily affect business, industry and labor alike. The whole thing is pretty much governed by the law of ratio.

Everyone knows by experience that the power of the dollar to-day is greatly diminished as compared with its pre-war value, but then there are more dollars. If through any subsequent economic change dollars become fewer, their value will be correspondingly increased. Hence no projected work should be deferred. Even if an owner is confronted with the necessity of disposing of his building later on and at that time be forced to take less than the property cost which, allowing for ordinary depreciation, would only be in a case where all values are down, the loss would be more apparent than real. He could then easily erect another building equally as good for the price at which he sold, and his money at the same time would go much further in buying all other commodities than it does at the present time.

The individual who intends to build should therefore not reckon his costs on the basis of prices of a few years ago, but more on what he has to pay for commodities in all other lines to-day. If this is done, the word "abnormal" as frequently used, can hardly be construed so far as building materials are concerned to imply a disproportionate advance. In a word, prices can only be regarded as high when considered on the basis of pre-war costs, and although a scarcity of a few materials may influence their market value, quotations for building products on the whole are only relative to costs governing all other necessities.

Priestman Wage-Fixing Scheme

The Higher Production Council of Great Britain has recently announced a new plan for fixing wages, known as the Priestman Scheme, which has been devised by a firm manufacturing machinery in London, England. By this new scheme a standard of production is established; that is the amount of work produced by the ordinary effort of a certain number of men, this standard being the basis of pay. Through increased individual effort this standard can be exceeded, and every employee receives a percentage on his wages for all output in excess of his standard. It is explained that the friction often caused by piecework is thus eliminated, and a maximum output is more possible. The Higher Production Council describes the scheme as the "solvent of many, if not all, of the difficulties now facing industry." The firm initiating the scheme has increased its average output by 50 per cent. through the operation of the scheme.

Provincial Builders and Supply Association to Meet

It is announced that the Provincial Builders and Supply Association of Ontario will hold a convention at the King Edward Hotel on February 10-11-12. Invitations have been sent out by Secretary Wright to the various exchanges and builders' associations throughout the Province, and also to the various cities and towns where the trade has not been organized. The meeting will be the most important that has yet been held covering the interests it represents, and present indications point to a large attendance. The business of the convention will be in charge of the following committees: General Convention and Entertainment Committee, P. L. Fraser, W. E. Dillon, and C. T. Penn; Resolution Committee, R. Marson, Stratford; Committee on Joint Industrial Council of the Building Trades, N. Gibbs, Sarnia; Technical Education and Apprenticeship, E. R. Dennis, London; Universal Building By-laws for Ontario, C. F. Till, Toronto; International Agreements, H. Hayman, London; Organization, Membership and Publicity, P. L. Fraser, Toronto; Legal Affairs, Mr. Norton, Sarnia; Lien Law, W. E. Dillon, Toronto; Workmen's Compensation Act, Geo. Gander, Toronto; Code of Ethics, M. F. Gibson, Toronto.

Control of Spreading Fires

The measures popularly advocated to control the spread of fire are four in number, namely, fire prevention, fire limits, fireproof construction, and fire departments. None of these alone can prevent a conflagration, and records show that together they have failed in almost every instance.

Fire prevention is the attempt to reduce the frequency of fires. The preponderance of disasters from unknown and trivial causes appears to forbid hope of controlling conflagrations by strictly fire prevention methods. It has been previously pointed out that, on the average, only one in 20,000 fires has reached the magnitude of a conflagration. That one fire is the problem demanding solution. If fire prevention successfully reduced the occurrence of fires in Canada to 100 per annum, there is no assurance that the spreading fire would not be one of the hundred. That depends largely upon the location of the outbreak and the character of its environs. When a small frame dwelling in Hull, Quebec, caught fire, that was the identical place where Hull and Ottawa began to burn. A similar occurrence in an isolated farm dwelling in a country district would have been equally serious so far as the individual building was concerned but it could not have resulted in the partial destruction of two cities. To debar conflagrations, therefore, fire prevention must not only diminish the frequency of fires, but also establish the confines of the occasional outbreaks that occur.—J. Grove Smith, in "Conservation."

Building Summary, 1919

Building operations in Canada during 1919 more than doubled the amount of work carried out in the preceding year. Reports received by CONSTRUCTION from thirty-eight important centres give a total for the twelve months just closed of $73,684,453 as against $35,454,930 in 1918. On the basis of percentage this represents a collective gain of 107.82 per cent., and shows a resumption of activities rapidly approaching and in some cases equalling the pre-war scale. The figures in a number of cases are incomplete, in that they represent the total for the year only up to December 20, when figures were submitted, while it is known that in several instances important permits were issued after that date.

Cities.	No. of permits for 1919.	No. of permits for 1918.	Total cost of buildings 1919.	Total cost of buildings 1918.	1919 compared with 1918 Increase % (x) Decrease % (†) Increase per cent.
Toronto	7,456	4,353	$19,470,000	$8,535,331	x112.19
Hamilton	1,409	752	5,025,135	2,471,764	x103.30
Brantford	500	336	1,097,455	760,000	x 44.40
St. Catharines	694	....	861,636	463,917	x 85.72
London ,Ont.	1,178	774	2,108,720	876,660	x148.54
Guelph	....	....	600,759	84,935	x607.16
St. Thomas	195	91	285,525	54,935	x424.91
Stratford	....	....	378,736	89,780	x321.82
Kitchener	325	153	1,176,622	236,062	x398.41
Niagara Falls	234	105	876,889	356,716	x145.57
Windsor	996	371	2,561.370	570.305	x349.11
Walkerville	....	....	2,008.000	153.000	x558.82
Peterborough	193	159	196,638	241,251	† 18.60
Ottawa	546	256	3,123.225	2,577,322	x 21.18
Kingston	517	456	653.279	318,943	x104.82
Brockville	....	....	57,150	32,800	x 72.20
Owen Sound	60	35	100,000	30,000	x233.33
Sault Ste. Marie	....	....	1,016,740	271,395	x274.63
Sudbury	....	....	321,400	101,875	x215.48
Fort William	154	115	627,080	535,615	x 17.07
Port Arthur	269	247	1,708,051	629,666	x171.26
Montreal	2,119	1,481	9,738,735	4,883,673	x 49.85
Sherbrooke	135	....	914,350	....	......
Quebec	683	538	2,134,219	904,375	x135.98
Three Rivers	333	220	1,149,150	641,800	x 79.05
Halifax	1,198	1,481	5,194,806	2,857,855	x 81.77
Truro	47	....	155,000	....	......
St. John	49	26	*506,540	351,323	x 48.18
Winnipeg	....	....	2,908,200	2,050,650	x 41.71
Brandon	57	55	98,537	99,022	† .004
Moose Jaw	....	....	577,000	567,645	x 1.60
Regina	....	....	1,696,520	1,006.000	x 68.64
Saskatoon	354	275	1,403,535	604,715	x132.09
Edmonton	303	126	918,346	351,510	x161.26
Lethbridge	72	51	162,110	135,550	x 19.59
Medicine Hat	61	41	254,843	78,390	x225.09
Vancouver	1,233	829	2,271,361	1,440,384	x 57.69
Victoria	313	146	466,141	289,760	x 60.87
Total (38 cities)	21,673	13.472	$73,684,453	$35,454,930	x107.82

* 169 permits for repairs, additions and alterations involving an expenditure of $118,300 not included in the above amount.

Figures submitted since the above summary was completed give Weston, Ont., a total for the year of $205.730.

Toronto has the largest total amounting to $19,420,000, which is an increase in excess of ten millions in the value of permits over 1918. In Montreal the value of permits was $9,738,735, or approximately 50 per cent. more than the corresponding figures. Halifax undertook developments involving $5,194,806. Vancouver invested $2,271,361, and Winnipeg registers a total of $2,908,200, despite the serious tie-up experienced during last summer's strike. All places intermediate to these points likewise made substantial progress. A feature worthy of note is the fact that eighteen of the thirty-eight cities reporting show investments of over $1,000,000 and upwards. Only two decreases were noted in the entire list, and these are both relatively small, in one case amounting to a mere fraction of one per cent.

In Ontario a most remarkable growth is indicated by comparative figures from various centres. London and the border cities of Windsor and Walkerville are well over the two million mark, while at Brantford, Kitchener, Sault Ste. Marie and Port Arthur, the totals noted involve amounts of slightly over a million and upwards.

Besides Montreal's figures, progress in the other parts of the Province of Quebec is made evident by Sherbrooke's investment of $914,350, and the totals of Quebec City and Three Rivers amounting to $2,134,219 and $1,149,150 respectively. Truro and St. John have substantial amounts further east.

Edmonton's total of approximately one million, and the respective amounts in Regina and Saskatoon of $1,696,520 and $1,403,534, as well as the gain in Victoria, and other prairie and coast cities, reflect the headway made in the West.

The accompanying table of figures gives the comparative amounts for 1918-1919 based on permits issued in the thirty-eight cities reporting and the percentage of increase or decrease in each case.

◆

The Outlook for 1920

Replies to an enquiry sent by CONSTRUCTION to the building inspectors and city engineers of various municipalities are very optimistic in tone, and indicate a heavy volume of building work for the coming year. Practically every section in the Dominion is looking forward to a period of activity which if fully realized will witness operations approaching, if not equalling, the heavy investment of the boom days of 1910-11. We append herewith the reports received, which, in a number of cases, give specific information as to the character of work in contemplation.

HAMILTON, ONT. — From recent enquiries and plans furnished this office, and enquiries for and the sale of sites, both for business and dwelling purposes, the prospects look very bright for the coming year. Two large factories will be built this winter, work starting on them almost immediately, one for the Carr Fastener Co. and the other for the Firestone Tire Co.

WM. J. WHITELOCK, *Building Inspector.*

TORONTO, ONT.—The outlook is very bright for a large building year.

G. V. PRICE, *Assistant City Architect and Chief Inspector.*

OTTAWA, ONT.—Included in proposed work for the coming year is a civic hospital to cost $1,500,000, and the Salvation Army Maternity Hospital, which will involve an expenditure of $100,000.

R. HENHAM, *Building Inspector.*

BROCKVILLE, ONT.—Among contemplated improvements for 1920 is a paper mill and the probable erection of an iron foundry.

GEO. K. DRURY, *Town Clerk.*

KINGSTON, ONT.—Present indications point to a good building year.

R. J. MCLELLAN, *City Engineer.*

LONDON, ONT.—Prospects look good for the coming year. A permit has just been issued for the new medical school, costing $300,000, which brings thte total for the year just closing to $2,408,720, as compared with $876,660 in 1918.

A. M. PIPER, *Building Inspector.*

GUELPH, ONT.—The outlook for 1920 is already very bright. Among projected industrial work is a factory for a large American firm which is coming to Guelph.

F. MCARTHUR, *City Engineer.*

ST. THOMAS, ONT.—Work to be carried out during 1920 will include operations by the Housing Commission, which is at present getting out plans. As to the probable extent of operations, definite figures are not available.

W. C. MILLER, *City Engineer.*

STRATFORD, ONT.—Expect record building year; preparations now being made for a number of developments.

City Engineer.

SAULT STE. MARIE, ONT.—The prospects for the ensuing season are very promising, although I am not in a position as yet to report anything definite, other than proposed extension to the High School and new Technical School, each involving the sum of $110,000. With the urgent demand for houses here, there is every likelihood that the government housing scheme will again go ahead this year, so that with certain business blocks in contemplation, the prospects are indeed very promising.

J. GOURLAY, *City Engineer.*

OWEN SOUND, ONT.—Several factory additions are being talked of at the present time.

CHAS. J. PRATT, *Building Inspector.*

KITCHENER, ONT.—Building prospects for 1920 are very promising. Several large extensions to factories are contemplated, including an addition to the Kaufman Rubber Co. and an additional building for the Lang Tanning Co.

B. G. MICHEL, *City Engineer.*

BRANTFORD, ONT.—The building outlook is good.

T. HARRY JONES, *City Engineer.*

SUDBURY, ONT.—A considerable number of houses will likely be built this year. No assurance as yet as to extent of operations.

BUILDING INSPECTOR, *Per George Elliott.*

FORT WILLIAM, ONT.—The building outlook for the coming season is fair.

S. MCNAMARA, *Building Inspector.*

QUEBEC CITY.—The prospects for 1920 are far better than they were at the beginning of the year just ended, and it is expected that the total for building operations will be over three millions.

A. D. TRUDEL, *Assistant Building Inspector.*

THREE RIVERS, QUE. — Between 300 and 500 houses must be built this coming spring to provide for increasing population. Altogether prospects are bright. The shipyards are already preparing new buildings and machinery for iron shops, and the pulp and paper interests setting up new plant.

ALD. MARTEL, *City Assessor.*

SHERBROOKE, QUE.—Location has been decided and plans drafted for model housing scheme involving erection of 100 homes in 1920, and an additional hundred in 1921. Other prospects include several commercial blocks, a rubber tire factory and an extension to the Connecticut Cotton Mills costing approximately $250,000 for building alone. Lots have also been purchased by private individuals for the erection of residences quite apart from the proposed housing scheme.

W. L. MCSWIGGIN, *Building Inspector.*

TRURO, N. S.—Dwellings are the only class of buildings in contemplation at the present time.

J. J. W. CAMPBELL, *Town Engineer.*

ST. JOHN, N.B.—There is no tangible evidence to guide one in making predictions as to the immediate future. A great deal will depend upon the cost of materials.

JAMES CARLETON, *Building Inspector.*

HAIFAX, N.S.—Work in contemplation includes a new theatre, several churches and large apartment houses. The outlook is very bright.

W. R. FEGAN, *Assistant Building Inspector.*

SASKATOON, SASK.—The outlook for the year points to a considerable amount of construction work. The following new work is assured and the money provided for same:

New collegiate, $350,000.

City Hospital extension, $250,000.

Normal School to be erected by the Provincial Government.

Extension of Victoria Public School.

Completion of Physics and Engineering Buildings, University.

Completion of Mayfair Public School.

These two latter only have foundations in at present.

There is also talk of a new theatre, new bank building, several warehouses and stores and a number of dwellings.

George D. Archibald, *City Engineer.*

REGINA, SASK.—Providing there is no shortage of materials or labor, the prospects for the coming year are very bright. The following is a list of projected buildings for this season, and their value:

Mastertons, garage	$ 30,000
Hardings, garage	30,000
Whelans, garage	18,000
Wood Vallance, warehouse	200,000
Leader Pub. Co., warehouse	10,000
Fairbanks Morse, warehouse	110,000
Winnipeg Ceiling Co., warehouse	40,000
Marshall Wells, warehouse	150,000
Merchants Bank, bank	175,000
City of Regina, hospital additions	85,000
City of Regina, pavilion	25,000
City of Regina, car barns	60,000
City of Regina, disposal works addition	30,000
City of Regina, exhibition buildings	60,000
Sask. Co-operative Creameries offices	200,000

R. Blaxham, *Superintendent of Construction.*

MOOSE JAW, SASK.—Plans for several business blocks are now being prepared by local architects, and at least one large school and additions to two existing schools will be constructed during the year. It is also expected that the C.P.R. will commence construction of a new depot here to cost $500,000, early in the spring.

J. Clark Keith, *Building Inspector.*

BRANDON, MAN. — Large buildings contemplated for 1920 include the General Hospital, to cost $250,000; Nurses' Home at the Hospital for the Insane to cost $150,000. The building outlook is good.

Building Inspector.

EDMONTON, ALTA.—There is quite a number of large buildings under contemplation and a few to be completed that have been held up by earl ywinter this year. Warehouse additions are far short of the demand at present, and this also applies in regard to dwellings which are quite inadequate to meet the demand, due to growth in population. Herewith are mentioned a few of the important buildings which will in all likelihood go ahead:

Reinforced concrete warehouse and offices for Marshall Wells, part 8 storey and part 2 storey, 100x150.

Brick building for the Edmonton Journal, 3 storeys, 50x150.

Brick building for a Union Telephone Station, part 3 storey and part 2 storey, 50x150.

Brick warehouse and offices for Carroll & Wilson, 4 storeys, 100x150.

Brick building for Bank of Toronto, stores and offices, 4 storeys, 50x85.

Flour mill for Western Canada Flour Mill Co., 4 storeys.

Public garage, 2 storeys, 50x150.

New theatre for Empire Theatre Company.

New Anglican Church.

Building Inspector, *Per W. Thoms.*

LETHBRIDGE, ALTA. — Several large structures are under consideration for 1920. The city will also likely make application for its share of the government housing.

M. W. Meech, *Building Inspector.*

MEDICINE HAT, ALTA.—At the present time several structures of importance are contemplated and all indications point to considerable activity throughout the season.

R. B. Pyper, *City Engineer.*

VANCOUVER, B.C.—The outlook for next year is, on the whole, promising. One $500,000 theatre is projected, and the present house shortage will necessitate many dwellings being put up.

Arthur J. Bird, *Building Inspector.*

◆

The H. Mueller Mfg. Company, Limited, are sending out an artistically printed wall calendar to the trade. It shows a very excellent engraved bird's-eye view of this firm's large modern plant at Sarnia, Ont.

◆

CONTRACTORS and SUB-CONTRACTORS

As Supplied by the Architects of Buildings Featured in This Issue.

DOWSLEY SPRING & AXLE CO.'S PLANT, CHATHAM, ONT.

Gypsum Roof, Ebsary Fireproofing & Gypsum Block Co.
Structural Steel, Canadian Des Moines Steel Co.
Steel Sash and Monitors, Trussed Concrete Steel Co.
Roofing, Carmichael Waterproofing Co.
Sheet Metal, Carmichael Waterproofing Co.
Painting & Glazing, W. H. Palmer.
Plumbing, J. W. Draper.

CANADIAN CO-OPERATIVE WOOL GROWERS, LIMITED, WAREHOUSE.

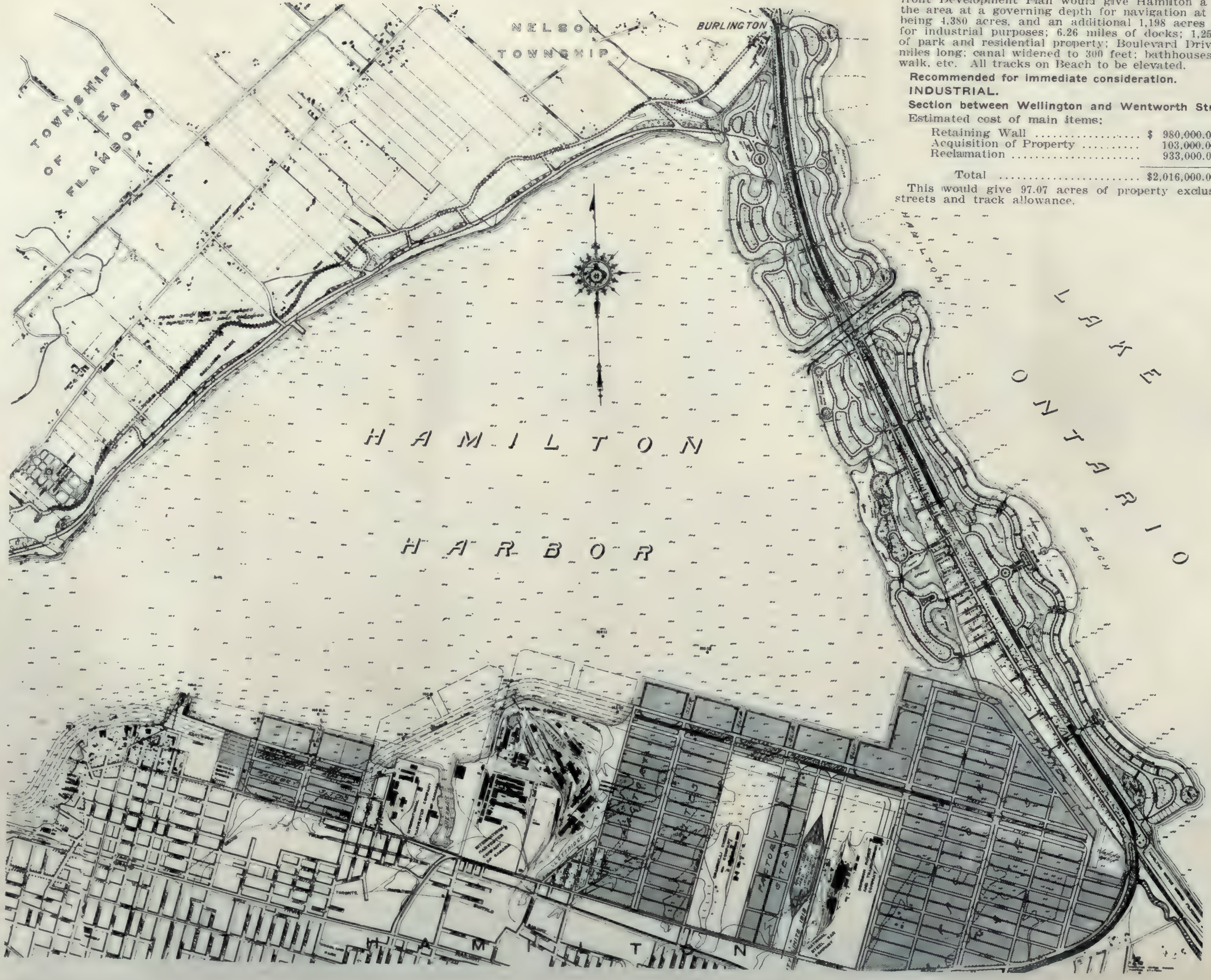
Carpentry, J. Robert Page.
Display Signs, J.E. Richardson & Company.
Drainage, A. H. Read.
Electric Wiring, Bennett & Wright.
Elevator, Otis-Fensom Company.
Masonry, J. Robert Page.
Roofing, Reggin & Spence.
Steel Work, Hepburn & Disher.
Wire Window Guards, Shipway Iron & Wire Manufacturing Co.

EDUCATIONAL BLOCK, ROYAL MILITARY COLLEGE, KINGSTON, ONT.

Heating, Plumbing and Ventilating Work, McKelvey, Birch Co.
Electric Work, H. W. Newman Electric Co.
Structural Steel, Hamilton Bridge Co.
Plastering, R. D. Clark & Sons.
Roofing and Sheet Metal Work, Thomas Irwin & Son.
Cut Stone, Ritchie Cut Stone Co.

HUNTER BUILDING, OTTAWA, ONT.

Plastering, P. B. Baxter.
Mastic Floors, Canadian-Johns Manville Co.
Ornamental Iron, Canadian Ornamental Iron Co.
Glass, Consolidated Plate Glass Co.
Plumbing, W. G. Edge, Limited.
Heating, W. G. Edge, Limited.
Ventilation, W. G. Edge, Limited.
Electrical, A. A. Giddings & Co.
Interior Trim, George M. Mason, Limited.
Sheet Metal, Hollow Metal and Kalamein, McFarlane-Douglas Company.
Elevators, Otis-Fensom Elevator Co.
Painting, W. H. Reid.
Roofing, J. D. Sanderson & Co.
Cut Stone and Granite, Tyndall Quarry Co.
Marble, Tile, Terrazo, Jas. Walker Hardware Co.
Hardware, Jas. Walker Hardware Co.
Prism Lights, Luxfer Prism Co.
Plumbing Fixtures, Imperial Products Co.
Radiators Fixtures, Imperial Products Co.
Radiators, Taylor Forbes Co.
Boilers, E. Leonard & Son.
Ventilation, Canadian Blower & Forge Co.
Boiler Feed Pumps, Darling Bros.
Vacuum Cleaners, United Electric Co.
Heat Regulator System, Canadian Powers Regulator Co.
Radiator Traps, C. A. Dunham Co
Stokers, Galt Stoker Co.
Filters, New York Consolidated Jewel Filter Co.
Steel Furniture, Steel Equipment Co.
Structural Steel, Dominion Bridge Co.
Cement, Canada Cement Co.
Gypsum Blocks, Ontario Guypsum Co.
Brick, Milton Pressed Brick Co.
Hollow Tile, National Fireproofing Co.



Proposed Water Front Development, Hamilton, Ont.

The completion of the entire work as shown on Waterfront Development Plan would give Hamilton a harbor, the area at a governing depth for navigation at 30 feet, being 4,380 acres, and an additional 1,198 acres of land for industrial purposes; 6.26 miles of docks; 1,250 acres of park and residential property; Boulevard Drive, 16.98 miles long; canal widened to 300 feet; bathhouses, board walk, etc. All tracks on Beach to be elevated.

Recommended for immediate consideration.

INDUSTRIAL.

Section between Wellington and Wentworth Streets.

Estimated cost of main items:

Retaining Wall	$ 980,000.00
Acquisition of Property	103,000.00
Reclamation	933,000.00
Total	$2,016,000.00

This would give 97.07 acres of property exclusive of streets and track allowance.

The Dominion Government have already made initial appropriation of $100,000.00.

Beach and Park Development:

Estimated cost of main items:

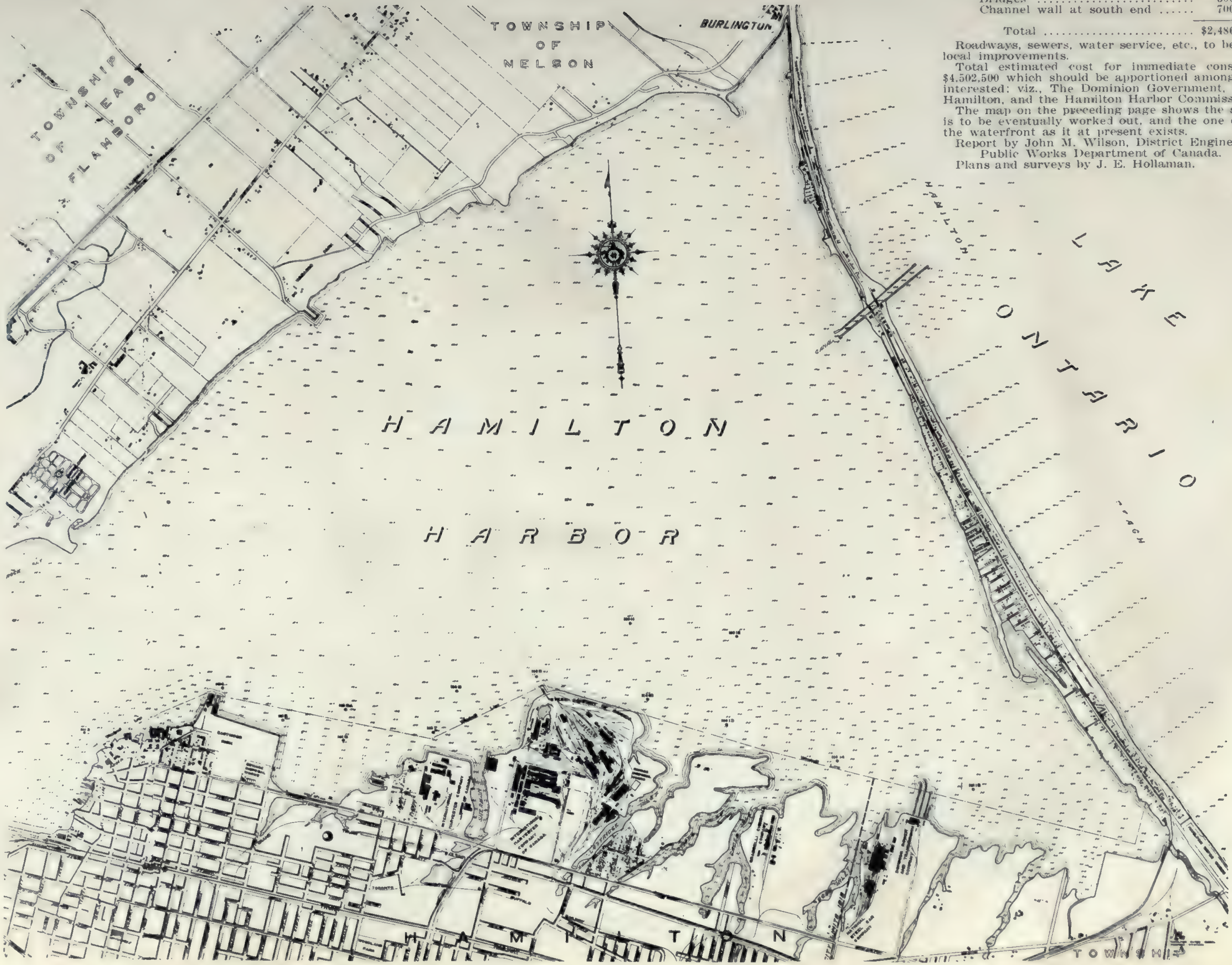
Reclamation	$1,486,000.00
Bridges	300,000.00
Channel wall at south end	700,000.00
Total	$2,486,000.00

Roadways, sewers, water service, etc., to be charged as local improvements.

Total estimated cost for immediate consideration is $4,502,500 which should be apportioned among the parties interested; viz., The Dominion Government, The City of Hamilton, and the Hamilton Harbor Commissioners.

The map on the preceding page shows the scheme as it is to be eventually worked out, and the one on this page the waterfront as it at present exists.

Report by John M. Wilson, District Engineer,
Public Works Department of Canada.
Plans and surveys by J. E. Hollaman.



Conference on Concrete House Construction

An event of special importance, particularly in view of existing conditions, is the National Conference on Concrete House Construction to be held at the Auditorium Hotel in Chicago, from February 17 to 19, inclusive. While designated "national," the scope of the conference, according to the announcement, is intended to include both Canada and the United States. Its object is to consider the housing problem in both countries, and to present, crystalize and make available information regarding the most modern practice in the construction of concrete houses and concrete housing projects.

It is hardly necessary to emphasize the vital need which exists at the present time for home building, or to point to the apparently unsettled condition which is to be found in many industrial centres due to a lack of adequate housing facilities. Although some efforts have been made here in Canada during the past year to relieve the situation, we have not as yet made hardly more than a start toward providing the actual dwelling accommodations required. For some time, in fact, the shortage of houses has attracted public attention not only to the immediate necessity for more houses, but also to the fundamental need for housing of the sort that makes for good homes and happy and contented people.

In other words, it is generally recognized that a house must be more than just a shelter and the community more than just a group of houses. Individual ownership of the home creates pride in the community and makes for good citizenship. More and more, home builders are realizing the necessity of building economically and permanently. Demand for information has been so great and practices so varied as to make the need felt for the standardization of the practice of constructing concrete houses.

The coming Chicago conference will therefore not only make an effort to devise some means for meeting this demand, but will pay especial attention to the methods of financing home building, community planning, fire protection and methods of construction of the various types of concrete houses.

The following committees have been organized:

Architecture and Design.
Community Planning.
Financing Permanent Homes.
Fire Prevention and Insurance Rates.
Building Codes.
Monolithic Concrete Houses.
Special Unit Houses.
Concrete Block Houses.
Concrete and Cement Roofing.

Many well known organizations are co-operating in this movement, among them being the American Concrete Institute, the Associated General Contractors of America, the Concrete Products Association, the Portland Cement Association, the Illinois Society of Architects, the Illinois Chapter of the American Institute of Architects, the U.S. League of Building and Loan Associations, and many other organizations of local and national influence.

Other organizations which will meet in Chicago at the Auditorium Hotel during the week the conference is in session, are the American Concrete Institute, the Concrete Products Association, the Concrete Block Association, and the American Concrete Pipe Association.

The conference will be attended by architetcs, contractors, community planners, cement product manufacturers, industrial and real estate development concerns, building and loan associations, and others interested in various phases of the housing problem.

◆

Construction desires to acknowledge the receipt of a 1920 Vest Pocket Diary, which is being mailed to friends and customers by the Canadian Westinghouse Company, Hamilton, Ont. In addition to space available for daily notations, it contains considerable general information for everyday use, as well as a number of tables and data in regards to belting, wiring, turbines and condensers, mechanical stokers, generators, railway motor ratings, tractive efforts, thermometer ratios, etc.

Sixteen Storey Hotel for Montreal

The Montreal City Council has adopted a resolution endorsing the erection of a sixteen-storey hotel. The proposal is now before the Administrative Commission with which any amendment to the present regulations restricting the height of buildings to ten stories must originate. Several prominent citizens including Lord Shaughnessy and President Beatty of the C.P.R. are interested.

Convention Date Changed

In order to avoid conflicting with the annual meeting of the Engineering Institute of Canada, to be held in Montreal, the Association of Canadian Building and Construction Industries have changed the date of the Ottawa Conference to February 2nd, 3rd and 4th, instead of January 27th to 30th, as previously announced. Sessions will be held in the Chateau Laurier, commencing at 10 a.m. on Monday, February 2nd, and continue throughout the period mentioned.

CONSTRUCTION

February, 1920 Volume XIII., No. 2

CONTENTS

LEAVES FROM AN ARCHITECT'S SKETCH BOOK 37
By Charles Dolphin.

ARCHITECTURE IN TORONTO: A RESUME 44
By A. Frank Wickson.

RECENT CONCRETE BUILDINGS 47
Factory of Crane Limited, Montreal, 47; Williams and Wilson Building, Montreal, 49; Carswell Building, Toronto, 53.

NEW CANADIAN NATIONAL TERMINAL, VANCOUVER 55

WHAT IS REGIONAL PLANNING? 60
By Thomas Adams, Town Planning Adviser to the Commission of Conservation.

THE OTTAWA BUILDING INDUSTRIES CONFERENCE 61

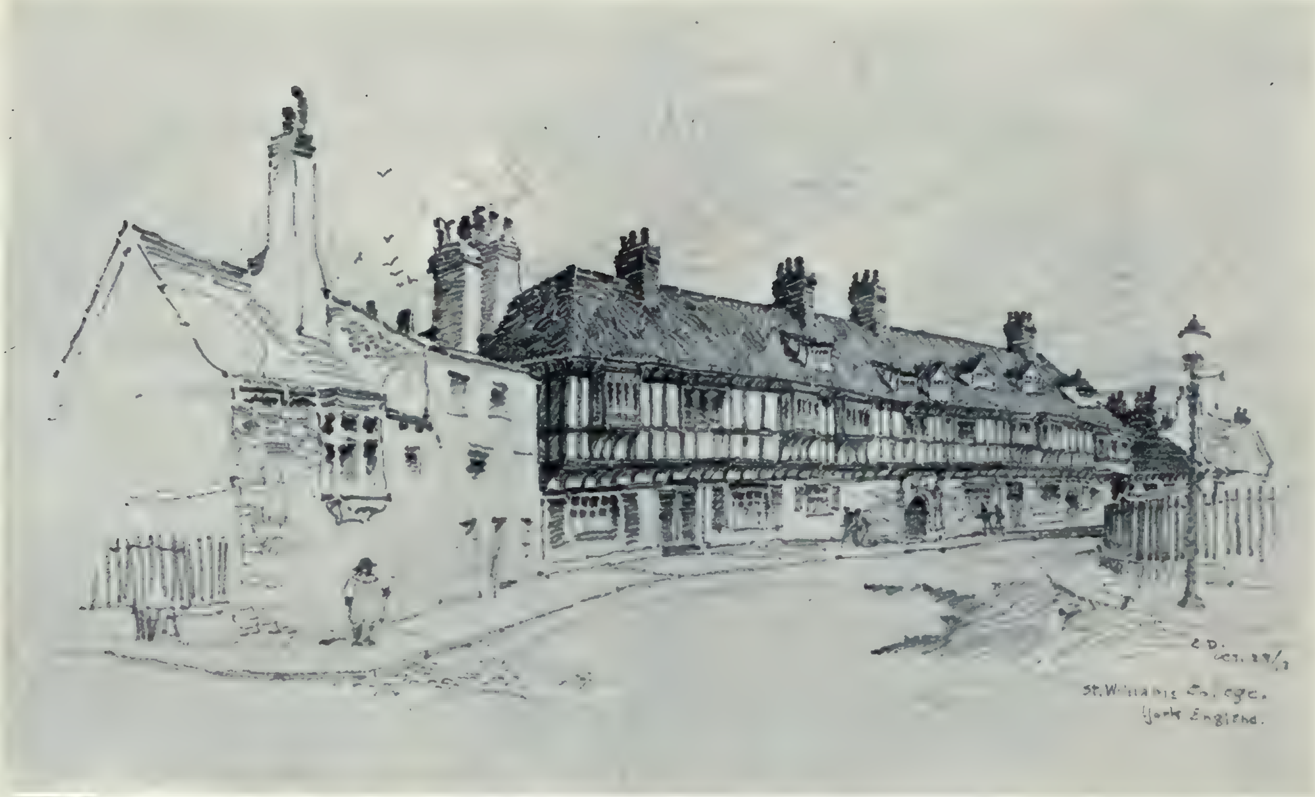
EDITORIAL 67
Ontario Association of Architects' Active Policy—Canadian Architect and Canadian Materials

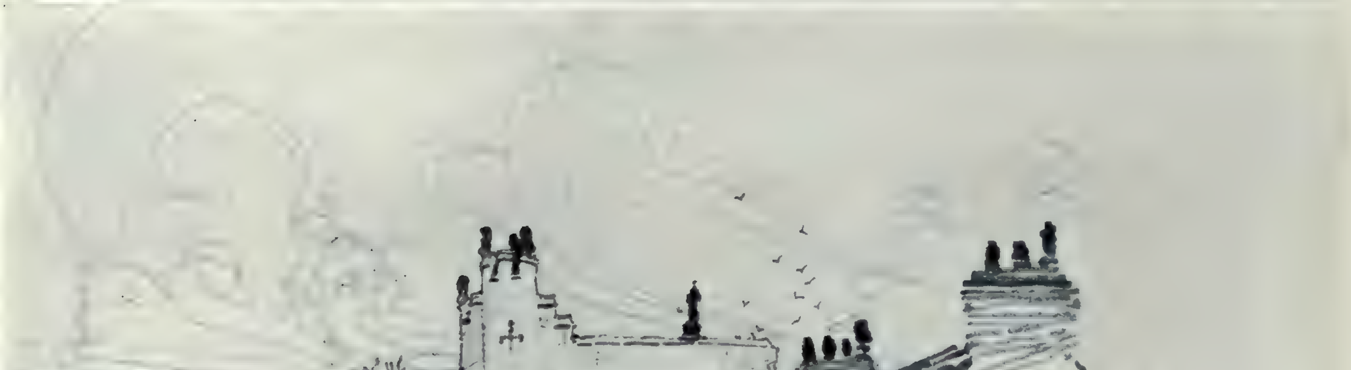
BOOK REVIEW 69

Frontispiece

SKETCHES OF QUAINT BITS OF YORK, ENGLAND 36

H. GAGNIER, Limited, Publishers
GRAPHIC ARTS BLDG., TORONTO, CANADA
BRANCH OFFICES
MONTREAL NEW YORK


C.D. Oct. 28/13
St. Williams College.
York England.


C.D. Oct. 29/13.
Goodhamgate.
Along the city wall at
York, England.

QUAINT BITS OF YORK, ENGLAND.

UPPER SKETCH: ST. WILLIAMS COLLEGE. LOWER SKETCH: GOODHAMGATE, ALONG CITY WALL.
DRAWINGS BY CHARLES DOLPHIN, ARCHITECT.

IN FRONT OF PETERBOROUGH CATHEDRAL.

Leaves From An Architect's Sketch Book

By Charles Dolphin.

The reproductions presented with this article which was written by Mr. Dolphin at the solicitation of **"Construction,"** are made from the author's own sketches, and with the exception of the Peterborough sketch are the exact size of the original drawings. In a subsequent issue, Mr. Dolphin has consented to present a number of pencil impressions of some of Old World work of France and Italy together with an outline of his itinerary and certain historical notations of value to students.—Editor.

THIS article is written, not with the object of portraying from an historical point of view, the various architectural works of the Old World, as seen by the author, but rather as the setting for impressions and benefits obtained by personal observation of famous monuments of art in Europe.

It is my opinion that all architects and draftsmen should make it a life ambition to make at their earliest opportunity, a trip abroad, for without wishing to enter into any controversial arguments as to the value or otherwise, of such a trip, it is my belief that an architect or draftsman's viewpoint will naturally be broadened by a personal examination of various subjects of which he can have gained but more or less theoretical impression by the study of text books, etc.

Secondly, it is my ardent hope that this article may be of help and guidance to all those who may read it, and who are contemplating a similar trip.

After having decided to take the step in 1913, my greatest concern at the moment was to determine what would be my itinerary and its probable cost, and my advice is to fix the amount you have to spend, then do the most you can with it. Of course there is bound to be a minimum amount under which such a trip may be taken. My own total cost was approximately $1,500 and covered a period of about ten months, during which I visited a considerable number of the most important points of interest in eight different countries.

Guide books and maps should be studied and in conjunction with choosing the important points that you wish to reach, fix your main line of travel throughout. Baedecker's Guide

PAISLEY ABBEY, SCOTLAND.

Books were, before the war, the very best references, and are, I should think, still available.

Sailing from Montreal, I had an opportunity of seeing the famous Quebec Bridge, then in course of erection, and I mention this fact because it impressed me very forcibly at the time—here was I, on my way to see the wonders of the Old World, and yet at the very start, I had an opportunity of viewing one of the wonders of the New World in the making, and many a time during my subsequent travels, I recalled the great bridge to mind when looking at some masterpiece of the ancients.

I should advise taking the Montreal route if for no other reason than the impression left in one's mind after leaving the mighty St. Lawrence behind.

As Glasgow was our port of disembarkation, I was very much impressed by the miles and miles of shipyards along the Clyde, and I understood, I think, a little more fully what the race fo armaments prior to the Great War that was coming really meant, and I was to receive more than one warning of it before I returned to Canada.

We passed close by the stern of the giant liner "Aquitania" as she rested high in the air upon the stocks, and I little thought at the moment as I gazed in wonder at her gigantic proportions that, in the very near future, that great ship would be sent to the bottom by an enemy torpedo, fired in the greatest of all wars, and in which I was destined to take an active part myself. I have often thought since the war of that splendid ship as I saw her in the making and what a terrible waste war really is.

I would like to mention as a warning to others that upon landing (it was dark) that although the Midland Hotel to which we were bound is not a great distance from the docks, our cabby must have lost his way, for it took us nearly an hour to get there. Of course,

EDINBOROUGH CASTLE FROM TWO VIEWPOINTS.

it cost us more in fare, but as the cabby was a Scotchman and consequently honest, we did not criticize, but rather thought like Mark Twain, in his "Innocents Abroad," "I was a stranger and he took me in."

Glasgow, though more of a manufacturing town and the centre of great shipbuilding plants, has a number of places interesting to an architect. The cathedral, though not as large as most, is very fine, having an excellent chapel and crypt, well worth the time of a sketch or two. The art school should be visited, if possible, as it is of the best, and its principal is only too glad to go over the establishment with an interested visitor.

UPPER SKETCH: MELROSE ABBEY. LOWER SKETCH: DURHAM CATHEDRAL AND CASTLE.

From Glasgow a tramway trip to Paisley to see the Abbey should be taken—for besides the Abbey, the ride is interesting in that it will give one a first impression of the countryside.

I had forgotten to mention that during the first part of my travels I was accompanied by a fellow draftsman, Mr. H. A. Dawson of Montreal, and want to say that if possible would advise travelling with a friend, for if one is as fortunate as I was in having such an excellent companion, the trip will be all the more enjoyable.

Leaving Paisley, we took the morning express to Edinburgh, and should like to say that wherever possible, day travelling should be the rule, as it is not only cheaper, but affords an opportunity of seeing the country en route. By this means I saw a great many interesting things that would have been impossible by night travel.

Edinburgh impressed us very much, its very fine Princes street, with its excellent shops on one side and the wonderful park and gardens on the other, while looming above all in solemn dignity, the famous castle, which seemed to me to resemble some giant guard brooding over the city below. In the distance can be seen the mountain on the summit of which King Arthur sat, and since known as Arthur's Seat.

A climb up to the top of Scott's monument will give a wonderful view down Princes street, and a day or two could be spent sketching around the castle—that is, if you are not taken for a defunct German spy—all spies in Europe were German before the war, and it will be interesting to know who will get the odious name now. It is better to ask permission to sketch near any military establishments—it saves a lot of temper and time.

OLD GATE.
Durham Cathedral. Eng.
C.O.
OCT. 28/13

UPPER SKETCH: ELVET BRIDGE, DURHAM ENGLAND. LOWER VIEW: OLD GATE, DURHAM CATHEDRAL.

Holyrood Palace should also be visited, and in passing I should mention that we enjoyed the wonderful drilling on the parade ground of the Castle, by the Kiltie garrison, not architectural, but well worth seeing, some of their splendidly executed drill movements are very amusing.

There is also a great cannon, much embossed, at the castle and pointing out over the city. It was one of many captured from the Russians at the Seige of Sebastopol in the Crimean war.

We then took a day's trip to the Firth of Forth to see the great Forth Bridge, and after arriving there and seeing the bridge from one end and the river bank, we bought a ticket across to the other side—this was well worth the time, for the bridge is without doubt one of the wonders of the world.

There are two main spans (of tubular steel), each one slightly less than the main span of the Quebec Bridge, and a great impression of the gigantic proportions of the bridge is gained by comparing it with the battleships generally at anchor under or near it.

An Impression of
Westminster Bridge London.
C.D/Nov/20/13.

WESTMINSTER BRIDGE, LONDON.

Returning to Edinburgh, we then took a train to Melrose to see the ruins of the beautiful Abbey there, and here we found one of the most beautiful little places in all the British Isles. The Abbey itself is of the best, and although in complete ruins with only the walls standing, it is so well cared for, with its grassy lawns among the stones, that we fell in love with the place immediately. The tracery of the chapel window is very fine and worthy of a sketch.

From Melrose we went to Dryborough Abbey and Stirling Castle, but with the exception of the very beautiful countryside round about and its associations with the history of Sir Walter Scott, it has little architectural attraction.

We subsequently proceeded from Melrose to Newcastle, where it was necessary to change cars for Durham, and its great cathedral. On our way we passed a portion of the ancient Roman wall, built across England by the Romans as a barrier against the tribes of the north, somewhat similar in purpose to the one built by the Chinese for fifteen hundred miles across the northern half of China.

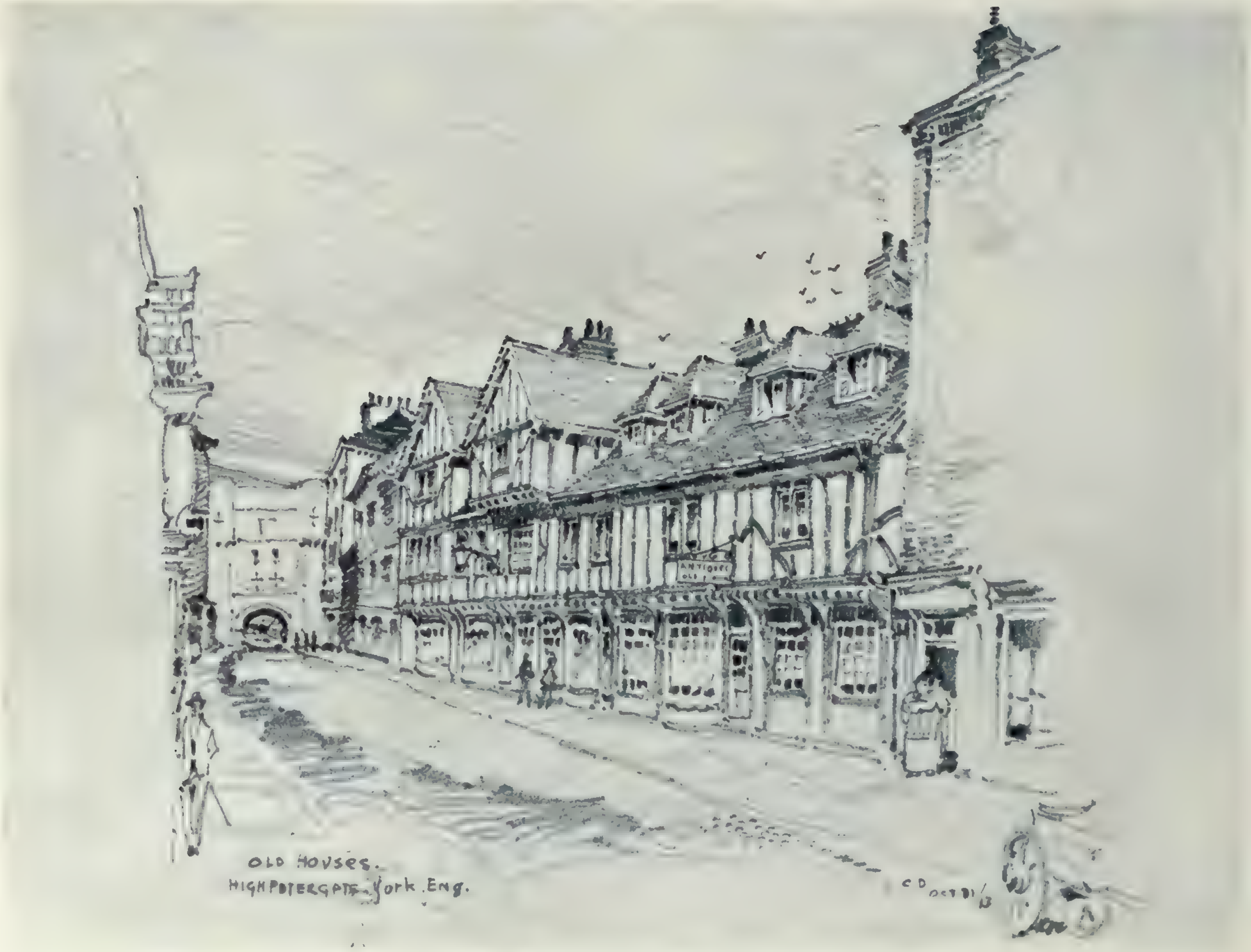
Arriving at Durham, we experienced our first impression of a distinctly English Cathedral town. Its restful air of quietude and dignity never left me all the time I was within sight of the magnificent Cathedral. I liked the Cathedral better than all others, perhaps partly because it was the first really large one that I saw, but the different periods of history as represented in its actual design struck me as much more impressive, some of its construction dating from early Norman times. Also the splendid way in which the Cathedral looms up above the trees, with its wonderful tower, as seen from across the river, is hardly surpassed.

There is great material for sketches and studies all about the church and town—one of many interesting things is the old stone bridge over the river with the houses perched on one end.

The gate leading to the courtyard of the Bishop's palace should be seen. As for the Cathedral itself, it deserves a complete description, of which time and space will not allow.

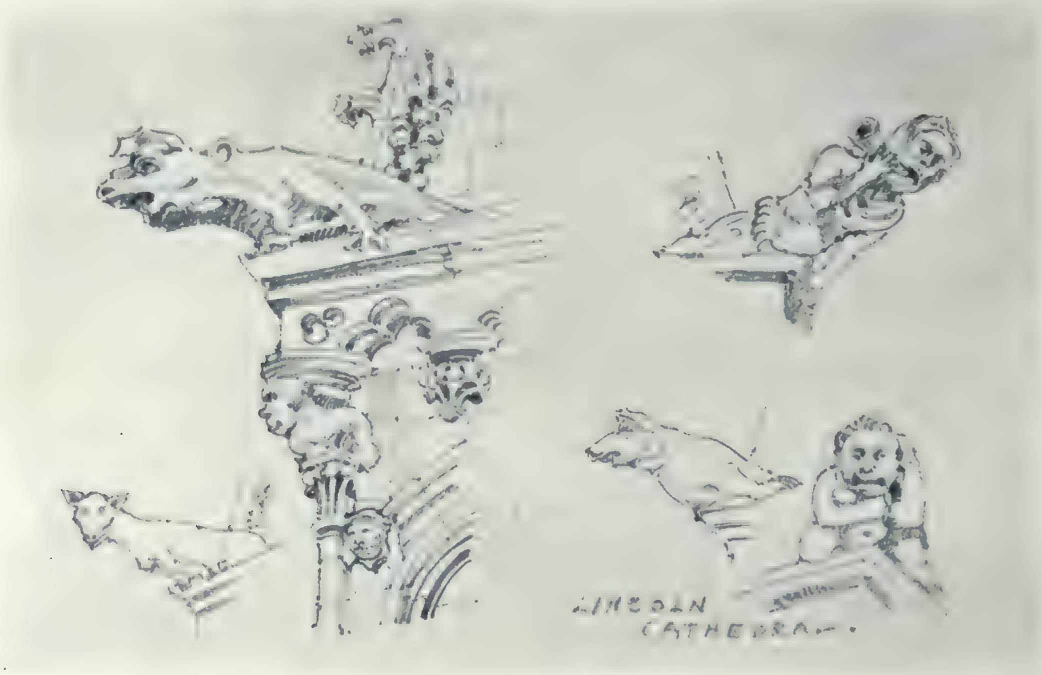
I might here sound a warning to the traveller to remember into which pocket he puts his small gold coins and the one in which he places his small change, for I very considerately tipped the waiter at one tavern (the Royal Arms, I think it was) with a nice new sovereign, same being similar to a six pence in size. I never discovered it until my arrival at our next port of call, and when I wrote back to an over-obliging, sharp-looking student, who, when we were in Durham, persisted in wanting to show us the town, and explained the case to him, he wrote back and said he had seen the waiter as requested, and that my little coin now rested in a safe place where he would keep it for me until such time as opportunity afforded his returning it to me. Needless to say he has it yet—again I was tempted to quote Mark Twain.

From Durham we then went to Peterboro where we spent a very interesting day in and around the Cathedral, a description of which is hardly necessary, sufficient to say that it is well worth a sketch or two—especially the old gate and Bishop's Palace in front of the Cathedral.

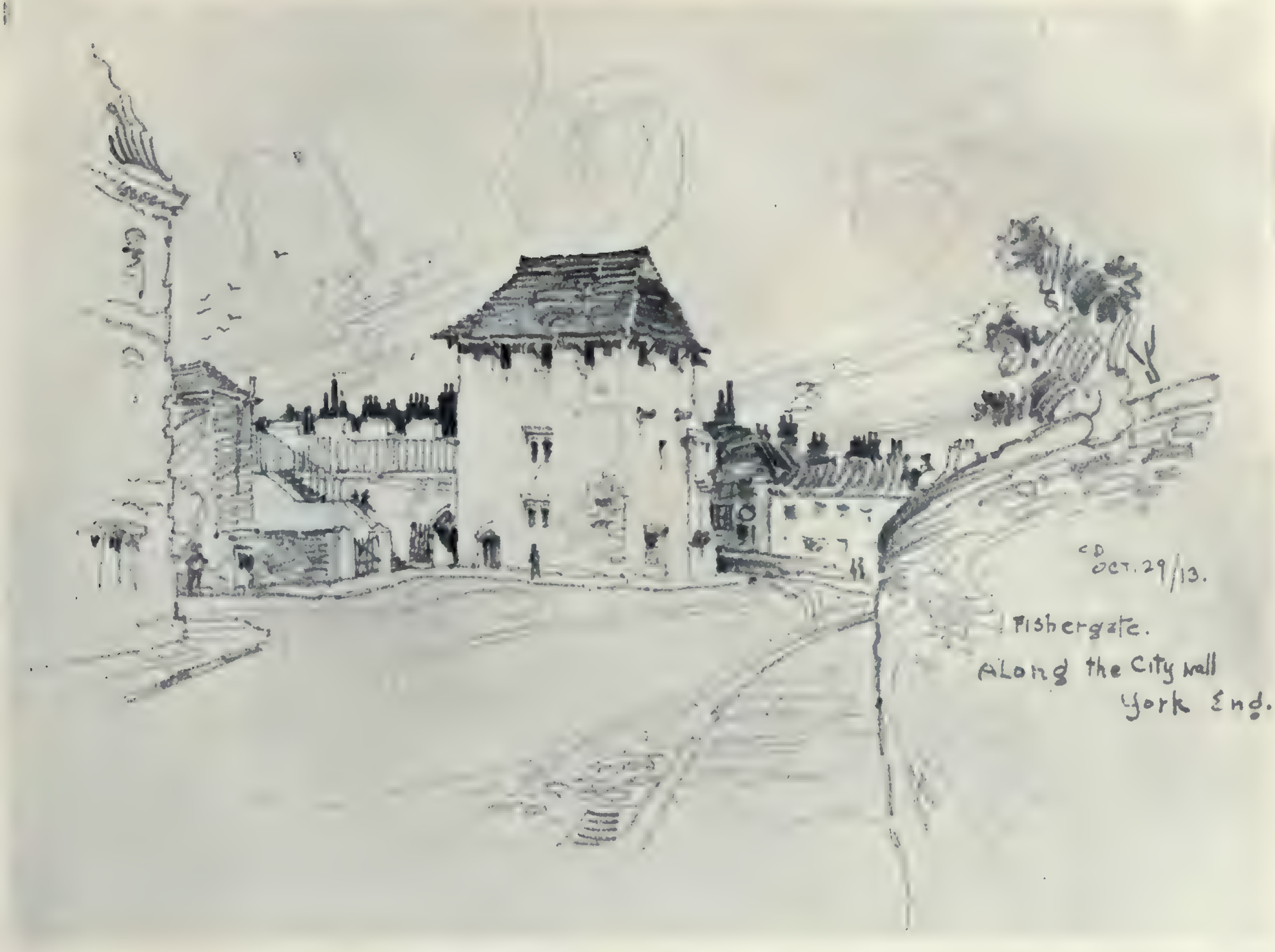

OLD HOUSES.
HIGHPETERGATE. York. Eng.
C.D. Oct 31/13

OLD HOUSES, HIGHPETERGATE, YORK, ENGLAND.

Leaving Peterboro I experienced another shock as regards money matters—a railway porter at the station to whom I had given threepence as a tip for putting my luggage into my compartment, handed me back a penny with the remark that I had given him too much, as twopence was the usual tip, and he did not want to spoil the tipping game. After the train started and I had regained consciousness, my faith in humanity was again restored.


LINCOLN CATHEDRAL.

GARGOYLES, LINCOLN CATHEDRAL.



FISHERGATE, ALONG THE CITY WALL, YORK, ENGLAND.

We arrived at York, the city of walls and spent a couple of days sketching around the Cathedral, and the ancient ramparts, the gates of which are very wonderful and well worth a special study. Old half-timbered houses on Highpetergate Street are worthy of a good sketch and should be seen.

We experienced our first difficulty with the English system of afternoon tea in York. The house at which we put up had tea at four and if you were not there you got no evening meal. It was very annoying, and the old lady who kept the place was highly insulted because we said we would buy our tea outside at our own convenience.

The Cathedral, of course, is very fine and I had the pleasure of making quite a number of sketches of it.

MR. CHARLES DOLPHIN, ARCHITECT
Whose sketches appear in this article

From here we then went to Lincoln to see the great Cathedral there, but although it is of very great size and beauty, it did not please me quite as much as those that I had already seen. Its facade had too much of an over-done appearance in my estimation, although, of course, very wonderful for all that. I made a great number of studies of the gargoyles, finials and bosses, on the exterior, of which there were a great number.

From Lincoln we then proceeded to London—the Mecca of most travellers.

London being the vast place that it is, space does not allow of a minute description of it, and for this reason I am constrained to refer the possible reader and traveller to the guide books. Endless personal experiences will overtake one in his rambles about London, and it would be the subject of a volume itself to chronicle these in an article of this nature, but it would, I think, be opportune before proceeding to describe events and scenes upon the continent which I have agreed to deal with in a subsequent issue, to mention a few places that it would be very much worth the while of an architect or draftsman to see, namely, Westminster Cathedral, St. Paul's Cathedral, the Tower of London, British Museum with its priceless relics and curios, Kensington Galleries, Windsor Castle, Hampton Court, and a trip to Oxford if possible. These few and an endless number of other wonderful places of interest will occupy all the time that one can spare in London.

Architecture in Toronto: A Resume

By A. Frank Wickson.

(Reprinted from "The Lamps," the year book of the Arts and Letters Club, Toronto.)

HAS Toronto regained its architectural morality? The question implies something once possessed and subsequently lost, and in this case the implication is well founded. There is ample proof that this city was, at a now distant date, quite aesthetically moral and equal evidence that for a protracted period it suffered from an epidemic of artistic idiocy and immorality quite as malevolent as a physical plague, for the results, except in the case of actual death from disease, were much more permanent.

Many of the buildings which would have proved the first part of this assertion have been destroyed, but there still remain a few which have always been admired as examples of good design. Conspicuous among these are the following, viz.:

Public Buildings.—St. Lawrence Hall, King St.; Old Post Office, Toronto St.; Osgoode Hall, Queen St.; Merchants' Bank, Wellington St.; Old County Court House, Adelaide St., the Court Room of which is our present Club Room.

Churches.—St. James' Cathedral; St. Michael's Cathedral; the original St. Paul's on Bloor St.; St. Stephen's, corner College and Bellevue; Cemetery Chapel.

Houses.—King and Bay Sts. (now Sterling Bank); Duke St., corner of George (without the mansard); Church and Gould (some of its charm has been lost by reason of alterations); a row on Victoria at the corner of Gould.

These and many others were varied in designs, some being Renaissance in style and some Tudor, but all well proportioned and of good composition.

After the decease of the architects who controlled the design of the important buildings of the period above referred to came the revolution. A new generation which knew not Joseph arose and they—they struck up the band and the orgy began. The spirit of the Romanesque, so wonderful while used by the great wizard, Richardson, once escaped from his control became an unstemmed plague spreading its bacilli all over this continent, and Toronto fell a victim. Everyone was imbued with the idea that a new style had practically been founded for this part of the world, and so flourished Romanesque, new Greek, old Aztec, and any other old or new thing which the imagination could possibly conceive of, all sheltering under the wing of the "new style." Each building was designed in the prevailing fashion and degenerating from its prototype, became itself, in turn another prototype. The attack was on the godly and the ungodly alike, for sacred and secular suffered in unison.

Poor old Salamanca Cathedral, if set down amongst some of Toronto's Romanesque, would have experienced the same sense of humiliation as a highly respected plutocrat amidst a bunch of seedy and debauched relatives. All sense of scale was lost and buildings looked as if they had been built of dry sponge and then soaked with water. Ordinary features became burlesque, enormous arches crushing down poor little dwarfed columns, centre piers supporting arches, circular towers resting on top of square and square over round. "Basket-work" brickwork broke out like measles, and in the poorer districts "brick fronted" houses covered the landscape like the locust.

Some years ago, however, a piece of architectural surgery commonly known as the Chicago Fair, relieved the pressure on the brain, the frenzy and the fever gradually subsided, and the moral idiocy began to disappear.

Has it entirely disappeared in Toronto? Well, it is tending that way, and it is with pleasure that one can instance numerous proofs of this. Among the admirable and scholarly public and commercial buildings there are the new Registry Office, the many banks in the heart of the business section and the C.P.R. station at North Toronto. Of factory buildings reference may be made to the MacLean Publishing Co.'s building on Centre Ave., having one face towards University Ave., which is now, unfortunately, partly obscured by another building, to the Christie Brown factory, King and George Sts.; to the Methodist Publishing Co.'s building on Queen St. West; to the Copp, Clark Co.'s building, Wellington and Portland, and the Wilson Lytle factory on Duke St. Only too many factory buildings are utterly devoid of design and in that respect we fall much behind some other cities.

In the scholastic field mention may be made of Hart House, Burwash Hall, the Technical School on Lippincott St., the University Schools, Bloor St., Knox College, and the new Trinity College which is not yet erected but drawings of which have been published.

St. Paul's on Bloor St., Knox on Spadina Ave., and Timothy Eaton Memorial are examples of the latest churches, though there are many here and there in the city, possibly less ornate but having good proportions, lines and details. St. John's near College and Lansdowne is of simple but effective design in brick and well illustrates its type.

In house architecture Toronto has no need to be ashamed of its doings, because for years past there has constantly been a sprinkling of good domestic work done. Such buildings as Sir Joseph Flavelle's in Queen's Park, E. R. Wood's in Queen's Park, Sir Wm. Gage's residence, Davenport Rd., Dr. Ross' house, 109 Warren Rd., Sir John C. Eaton's on Davenport Rd., Ralph Connable's on Lyndhurst Ave., and Mr. Blackwell's house on Dunvegan Rd., are worthy of being mentioned though perhaps it is rather invidious to mention any when so many might be spoken of. A somewhat smaller house of an attractive character is Col. MacLean's, Wells Hill, a simple, well-proportioned plaster house, and one of a type of which there are several good examples.

In the more thickly populated portions of the city there are many streets being built up with detached houses similar to each other in character, of questionable design and differing sufficiently to result in being neither a satisfactory separate unit nor a part of a whole. If silhouetted, the skyline of one of these streets would make a good suggestion for a piece of jazz music of the jazziest kind. At present one of the fashionable features in these houses is to have enormous battered piers supporting a simple roof, piers that look as if they would carry an end of the Quebec bridge.

How one longs to see a street built up with the small house attached, forming simple but well composed groups. The housing and town planning projects are our hope for the future of the small house, and when some of these projects now started become realities it may be that a new era will have set in, not only for the smallest type of house but even for those average cost buildings above referred to, with the angular Atlases holding up imaginary worlds.

In the case of the larger houses we may expect to see many of the Georgian type or the simple plaster house with numerous French windows, giving a general feeling of comfortable homeliness, a type that, it is to be hoped, the public will appreciate and enjoy.

◆

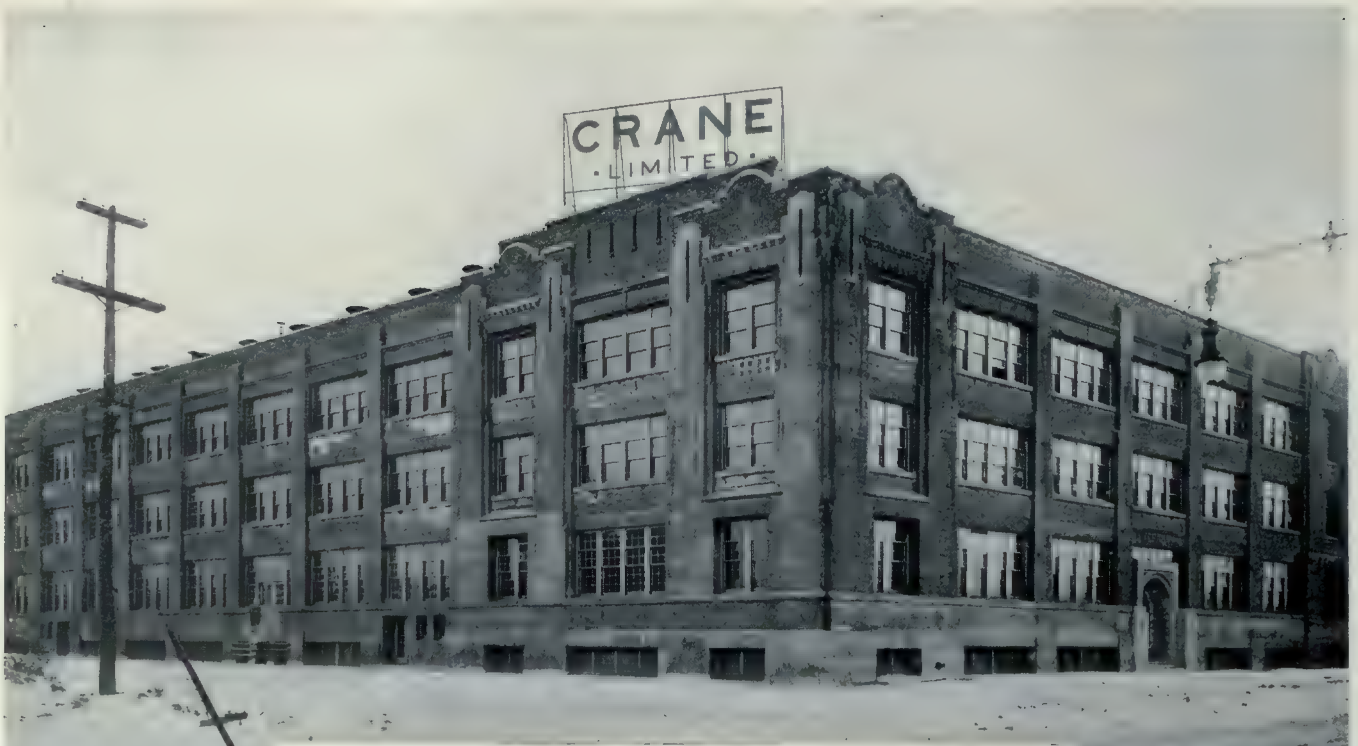
Looking for Another Pompeii

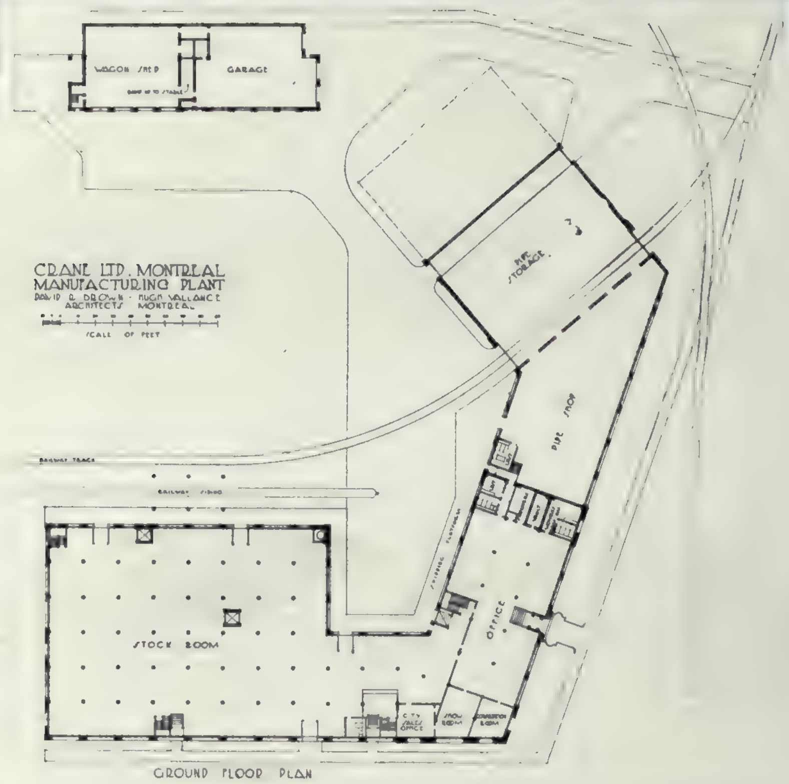
During the war archeological excavations were continued at the Italian colony of Syrenaibca on the north African coast, and now comes the news that what has been found already promises the uncovering of another ancient city as important as Pompeii. Once the spot was a Greek colony, with the civilization of Greece transplanted to the soil of Africa. The work has been carried on during the war under the supervision of Prof. Lucio Mariani, director of the archeological service of the ministry of the colonies, and the prediction is now made that the newly discovered city will eventually prove actually richer than Pompeii in its evidence of a past civilization. Here have been found already statues of the Graces, a Hermes, an Eros, an Alexander the Great and, most impressive of all, the Aphrodite of Cyrene, which is said by certain connoisseurs to be a fair rival in beauty to the Venus of Milo and the Venus of Cnidus. The discoveries have extended over a good many years. It may be added, however, as an illustration of the modified joys of archeology, and the introduction of a new mystery into the history of art, that the Aphrodite of Cyrene lacks both head and arms. The world may wonder what she looked like as well as what she was supposed to be doing.

◆

Toronto Engineers Report Good Year

The Engineers' Club of Toronto has just closed the 20th and most successful year in its history, and the directors have decided, owing to the limit of accommodation in the present quarters being almost reached, to double the amount of the entrance fee. The following officers were elected for 1920: President, Melville P. White; 1st vice-president, Tracy D. LeMay; 2nd vice-president, J. B. Carswell; 3rd vice-president, W. R. McRae; directors, J. R. W. Ambrose, A. B. Cooper, E. G. Hewson, Charles H. Heys, Arthur H. Hull, J. H. McKnight, L. V. Rorke, J. R. W. Wainwright, Walter F. Wright, Major E. W. Wright, T. S. Young. Mr. R. B. Wolsey continues in the capacity of secretary-treasurer.

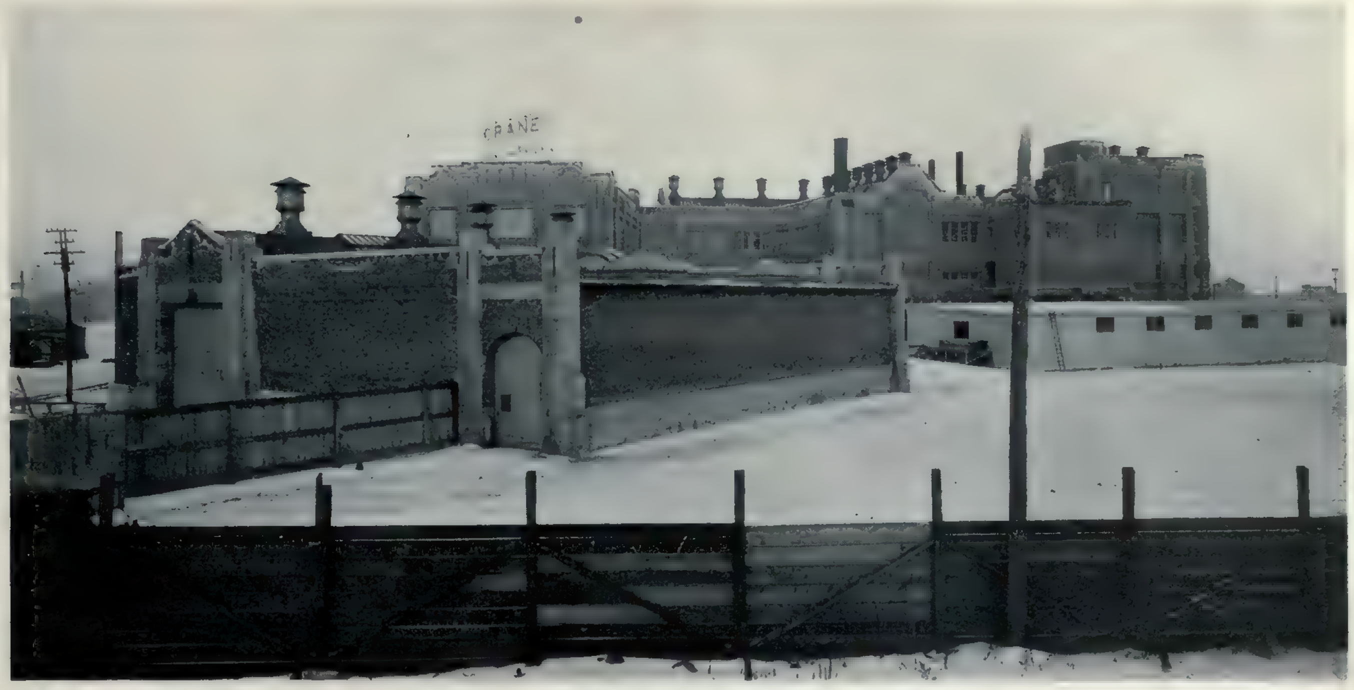




FACTORY
OF
CRANE
LIMITED,
MONTREAL.

BROWN
&
VALLANCE,
ARCHITECTS.

GENERAL VIEW OF PLANT.

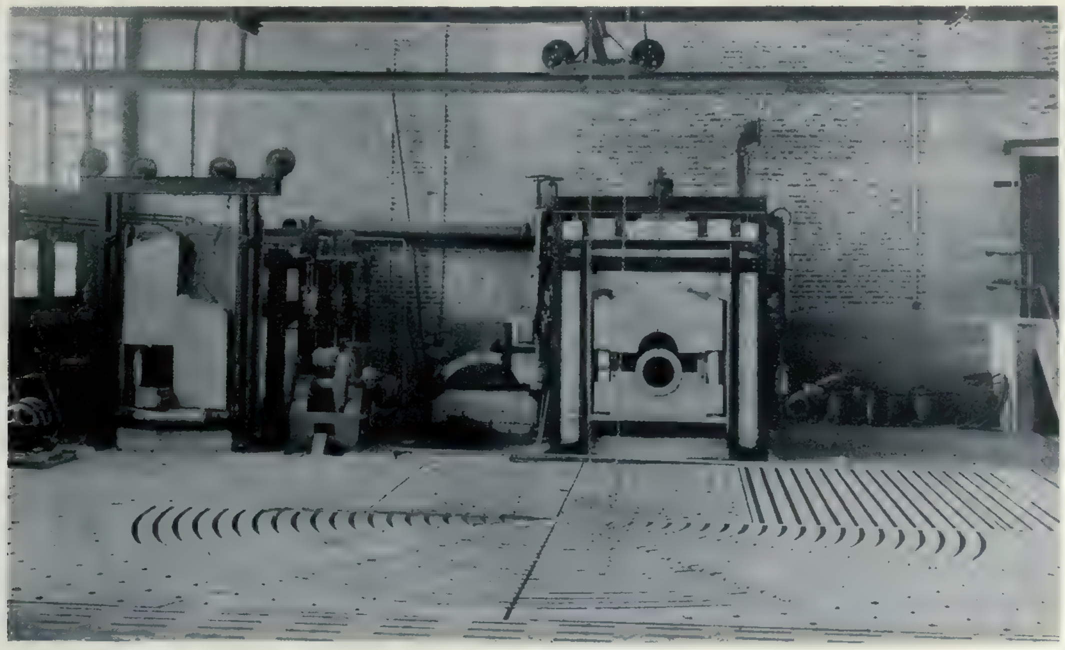


REAR VIEW: FACTORY OF CRANE LIMITED, MONTREAL.

Recent Concrete Buildings

THREE recent examples of the use of concrete in factory and warehouse construction are illustrated in the accompanying views, the exteriors of which in two cases show the use of the material as an integral part of the external scheme, while the third is a concrete structure with a modernly designed stone front. The interest in the three structures in question lies in the individuality of the designs as well as in the offices of two of the buildings which denote an architectural consideration which it is to be hoped will become further manifest in commercial and industrial work.

The Crane Company's factory, the largest of the three, occupies a site 420 by 360 feet, and is "U" shape in plan, a considerable portion of the site being reserved for yard space and shipping facilities. The type of construction employed is flat slab reinforced concrete, designed according to the four-way system. The supporting columns are octagonal in shape and the floor panels 20 by 20 ft., the ground floor slab being 12 in. thick and designed to carry a live load of 500 lbs., and the upper floors which are 9 in. thick to carry a live load of 225 lbs. It is at once a building which denotes its purpose and the stability of the structure. The heavy pilasters which indicate the position of the col-



PIPE BENDING DEPARTMENT.

FIRST FLOOR OFFICES, FACTORY OF CRANE LIMITED, MONTREAL.

umns form well spaced divisions in the exterior walls and have permitted of a symmetrical treatment. The effect is further enhanced by double and triple mullion three sash windows and brick panels and parapets, which altogether make the building noteworthy as an example of modern factory design.

The interior of the office portion of the building is also deserving of note, the scheme being simple and impressive and presenting an orderly arrangement suggestive of efficient business methods. The main entrance itself is carried out in cut stone and leads to a vestibule finished with marble walls and steps which give access to the office or main floor level. The accommodation of this floor is shown in the accompanying plan. From the office a corridor leads into the pipe bending shop and thence to the pipe storage. On the other side the ground floor consists of a stock room for fittings. A platform at the rear for both teams and cars, extending the full length of the building, facilitates the delivery and shipment of goods; and special provision has been made for the unloading of coal, which is brought in on cars and dumped over iron hatchways into the coal bunkers.

The second floor is occupied by the milling and finishing rooms, carpenter and pattern shop and storage for plumbers' supplies, while the top floor is devoted to the cast iron and brass foundries and brass finishing department.

The building is excellently lighted throughout, the system of fenestration being so considered as to provide a maximum degree of natural light in every part of the interior and is further assisted when occasion demands by a carefully planned electrical installation which is so installed as to produce an even diffusion of light in both offices and industrial departments.

WILLIAMS AND WILSON BUILDING.

The introduction of outside light into the interior was also an important factor in the design of the Williams & Wilson building, Montreal, which is also illustrated. This is evidenced by the vertical emphasis of the design of the principal elevation. By the treatment adopted a result has been arrived at which gives the front a maximum glass area, and this is further supplemented by the unbroken expanse of windows along the entire length of the upper stories. While constructively of a type which is eminently suitable to the purpose for which it is intended,

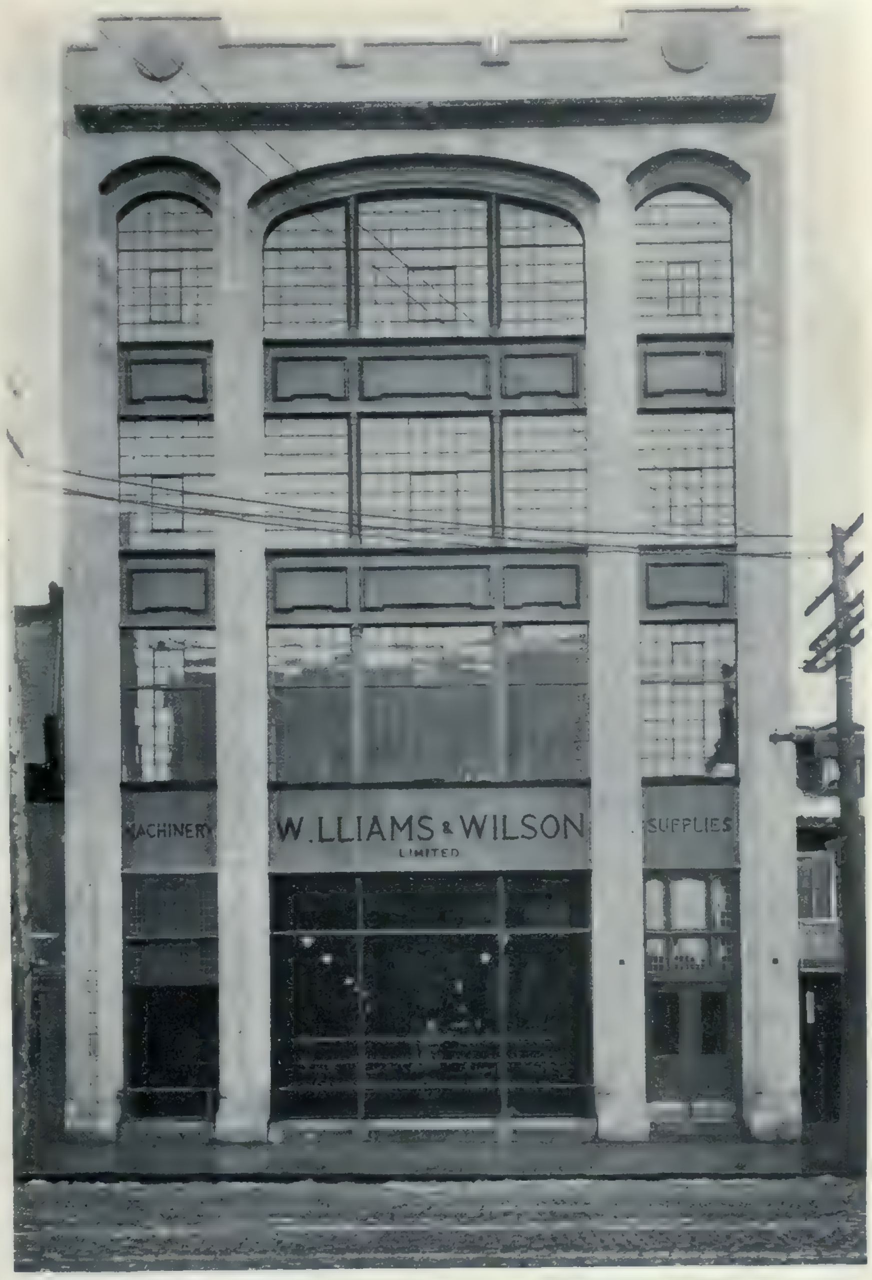
GROUND FLOOR OFFICES, FACTORY OF CRANE LIMITED, MONTREAL.

vis., that of stock and sales rooms for machinery and machinery supplies, it is more the architectural scheme of the interior rather than the physical character of the structure itself which makes it especially worthy of attention. This is particularly to be observed in the general and executive offices which are shown in the two photographic views presented. In these offices the woodwork, including trim counters and dado, is of selected white maple, the floors laid in squares of Tennessee marble, and the lighting fixtures of special design. The design and workmanship of the woodwork and bronze fittings, which were executed by the Bromsgrove Guild, are of a very high order, and reflect this firm's craftsmanship ability. A feature is the bronze metal sash forming the partitions dividing the offices and which permits of a view from one room to another. The furniture and office equipment have also been selected to be in character with the scheme, and even such minor details as the floor inserts which does away with unsightly telephone connections have been carefully considered, making it in every way a handsome office suite.

Owing to the purpose of the building the floors are designed for heavy loading, the ground floor being figured for a live load of 300 lbs., and varying from this to 100 lbs. for the office floor, and 250 lbs. for the two upper floors As difficulties were encountered due to a sandy soil and ground water, the wall footings were designed on the cantilever principle, of heavy reinforced concrete, the basement floor being 12 inches thick to prevent uplift, and treated together with the walls with a waterproofed mixture.

The building has a frontage of 44 feet and runs through a distance of 188 feet to Montfort street at the rear. The construction throughout is of reinforced concrete, enclosed with brick curtain walls on all sides except the front. The Inspector street facade, which is the principal elevation, is carried out in limestone, bonded to the concrete, and divided into three bays. Between the piers the entire front consists of cast iron panels and glass, the centre bay being of sufficient width to provide a 25 ft. display window at the ground floor level. The ground floor is 4 feet above Inspector street, and the display window is supported by a concrete beam at the street level. Oak is used for the entrance doors and marble is employed for both the vestibule walls and the steps.

The Montfort Street elevation is laid up with red brick with the concrete beams exposed. On this side the lower portion consists of a shipping area recessing 35 ft. into the building to a platform which is three feet above the ground level. This allows for the trucking of goods directly onto the motors and lorries, and avoids any obstruction of street traffic.



WILLIAMS & WILSON BUILDING, MONTREAL. T. PRINGLE & SON, ARCHITECTS.

The third floor of the building is used for stock purposes and is laid up in cement treated with an integral hardener and finished with a two-coat cement dressing. The top floor is equipped as a machine and woodworking shop, the shafting hangers being carried by inserts set in the concrete beams. The building is equip-

GENERAL OFFICES, WILLIAMS & WILSON BUILDING, MONTREAL.

ped with an outside fire escape and all windows throughout are of the steel sash and wired glass type, the interior stairs being of steel with slate treads and protected by steel and wired glass enclosures.

CARSWELL BUILDING.

This factory is located in Toronto on the south side of Adelaide street just west of York street, and has a frontage of fifty-one feet and a depth of ninety feet.

The building is five stories high with a heating cellar in addition and is constructed of reinforced concrete and brick curtain walls. The roof is built with a hollow space to form a protection from heat and cold.

The factory has been designed on the factory daylight saving plan, and by the fullest use of steel sash at the front and rear a condition approximating daylight has been created inside.

The various floors are served by an automatic push button control passenger elevator near the front and a freight hoist in the rear. It was erected at a cost of about seventy thousand dollars.

Color in Decoration

Mr. H. K. Prosser recently delivered an interesting address before the Incorporated Institute of British Decorators on the subject of "Discord and Harmony of Color in Decoration." To procure harmony, he said, the proportion of color was one of the chief matters to be considered, and in this connection the size and aspect of the room to be decorated must be considered. Color, like everything else, was, he said, a matter of vibration. By far the easiest way to produce harmony was by the use of tones of one color, but decoration by this means became monotonous. Many rooms treated in blue and green were condemned on account of their being cold and dull. If red, orange, and yellow were used the result was too warm. The only course possible to secure harmonious results was the use of blue, green, and yellow. It would be most difficult to produce a scheme of decoration where the whole range of colors were used. One discordant color often spoilt a room, but if another discordant color were put near the effect was broken, and the whole would

EXECUTIVE OFFICES, WILLIAMS & WILSON BUILDING, MONTREAL.

make for harmony. All rooms should be worked out in logical color schemes, and he thought that consideration should be given to the color decoration of offices and workshops in order that the employees should be kept physically fit and that the greatest amount of work should be produced with the least possible fatigue. Yellow produced on the mind the effect of sunlight, blue the vibration of the firmament, and green the early spring. Little knowledge was a dangerous thing in the case of color, and the quantities used in rooms were seldom logically proportioned. This could be done either by scientific or theoretical methods, but it was impossible to prove certain points by science. The Chinese were brilliant colorists. Their colors in themselves were discords, but they produced harmony by the use of different shades or tones of one color. Few people could visualize color, and there was no road to true harmony except through the laws of science, based on the laws of vibration. If color harmonies were worked out by scientific instruments, more harmonious results would be arrived at. Each color in the spectrum had its own purpose. Red was the warmest, and changed less in the light or dark than any other. Orange and yellow were warm; green could be either warm or cold; blue was cold. The decorator had much to contend with in decorating a room in which the owner desired to have all his own pictures and accessories. Black could be used and would produce harmony, but few people would allow this. To arrive at harmony, the colors must be standardized, and everybody must use the same. The laws of color must be understood by all who used them. Harmony could only be arrived at by the use of instruments which recorded the color, rate and length of vibrations.

In the discussion which ensued, the value of the use of instruments in the determination of a color scheme was strongly criticized, and it was pointed out that this would reduce the art of the decorator to merely ordering a stereotyped scheme from a catalogue.—"The Builder."

Zoning and Architectural Practice

Zoning makes many appeals, both to owners and non-owners of real estate. As it is an insurance against depreciation of values caused by a change in the character of new buildings constructed, or by change in the character of occupancies, the appeal is selfish but perfectly legitimate. This reasoning, says the "American Architect," applies to every locality because a nuisance can depreciate a mercantile or manufacturing property as well as a residential one. A competent zoning plan also prevents certain developments that are not reasonably sure of success, such as those often promoted and exploited by real estate speculators. Zoning further provides protected and decent residential sections for workers, with adequate transportation to their places of employment, recreation and shopping. Such a zoning plan is just and equitable to all classes of citizens.

Zoning appeals to non-realty owners by satisfying their sense of orderliness and fitness. These citizens have every right to protection from nuisances, and to life and work in an attractive, healthy and well ordered community. The necessity for zoning as a surety against future loss and for social community welfare is generally recognized by all thinking persons.

Zoning is the paramount necessity of urban American communities. Notable progress is being made along these lines in all parts of the country. Illinois has recently passed an enactment enabling its cities to undertake this work. In Chicago plans are under way for the creation of a zoning ordinance which will be of tremendous importance to its citizens. Several large cities, notably New York and St. Louis, have such laws. The fundamental requirements of zoning laws are not generally understood and those with actual experience in such work are few in number. For this reason the personnel of committees or commissions created for the formation of zoning laws, is of supreme importance. All of the major interests, both material and social, should be competently represented.

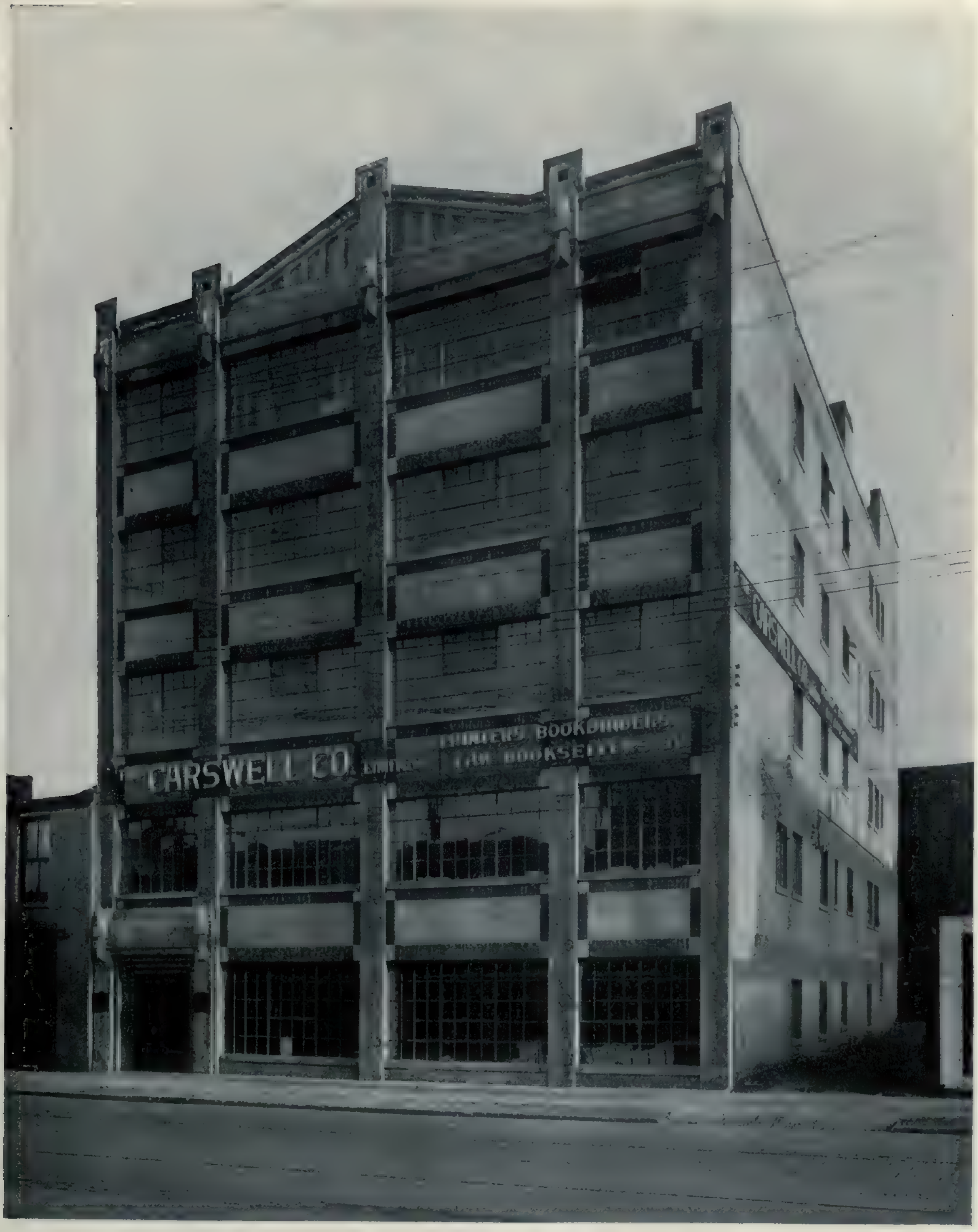
SHIPPING AREA, WILLIAMS & WILSON BUILDING, MONTREAL.

The physical elements of a city consist of buildings, streets, parks and public utilities such as sewers, water supply, lighting and transportation facilities. Of these improvements buildings out-value all of the others together by a very large percentage. These tremendous values, represented by buildings, are the handiwork of architects and are only possible of construction because of their abilities and efforts. Therefore the value of the architect to the community is apparent.

The practice of architecture requires a technical training unexcelled by any other profession. Its scope is necessarily broad and diversified in order to satisfy the demands of modern building construction. No other constructive human activity controls such great investment values.

The work of the architect is essentially that of measuring requirements and so planning as to satisfy them, a truly constructive effort.

The preparation of a zoning law requires a survey of the existing conditions, a vision of their future growth, a measurement and valuation of the component elements and a plan whereby the rights and equities of all may be conserved—all essentially the work of an architect. The work of the architect includes the housing of every human activity and as the building has a marked influence on the physical, mental, moral and spiritual condition of the population, he has an appreciation and understanding of those things which should control the formation of a zoning law.



CARSWELL BUILDING, TORONTO. C. H. ACTON BOND, ARCHITECT.

The ability to carry a precinct or ward in an election must not be the criterion that governs the make-up of a zoning commission but rather the ability to render an adequate service to the community. It is possible in many walks of life men can be found well qualified for this work, but in none are there any persons more proficient than in the architectural profession.

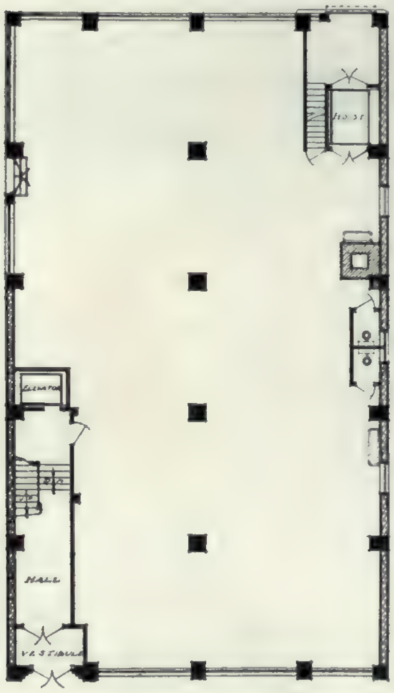
◆

The Fall of a Chimney

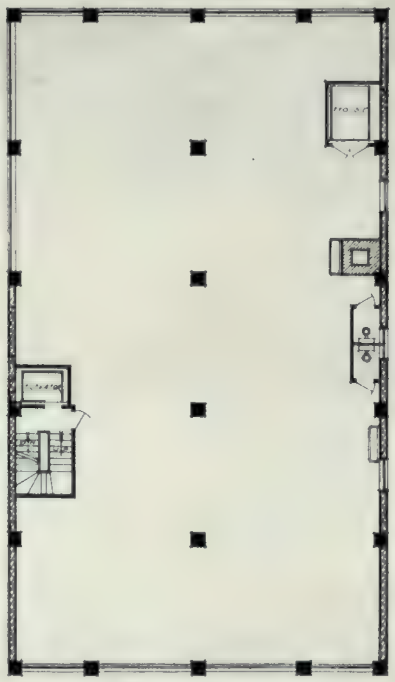
The Vigo chimney, at Northampton, England, for nearly fifty years the most prominent county landmark, 250 feet above the surrounding landscape, is reported to have disappeared in a crash of falling bricks and a cloud of dust, by the "Building News" of London. It took two years to build and about two seconds to demolish. Three men were killed during its construction, but its destruction was happily attended by no unforeseen incident. The chimney was dated 1871, and is said to have contained two million bricks and to have weighed about 2,000 tons. The work of felling was entrusted to Mr. Joe Ingram, a son of the well-known "Parachute Joe," who occupied two days in preparing the base of the chimney before "blowing" it with two pounds of gelignite.

INTERIOR VIEW, CARSWELL BUILDING, TORONTO.

For a moment after the shot was fired nothing happened. Then the chimney swayed slightly and suddenly it fell, not sideways, as had been expected, but straight down as if the earth had opened up to receive it. It simply collapsed on its base, "sat down," as someone said, and all was over. The bricks, which lie in a huge pile, are good, and said to be worth at least £1,000, and there are sufficient to build a large number of cottages.



GROUND FLOOR PLAN.



TYPICAL FLOOR PLAN.

Antiseptic Damp-proof Ceilings and Walls

The woodwork of stables, abattoirs, laundries, etc., a contemporary states, can be protected against humidity and decay by plates made from paper pulp impregnated with asphalt and provided with sharp dove-tailed grooves to retain mortar. They are attached with 1½ in. long galvanized nails to lathes fixed under the ceiling joists. Four-and-a-half in. wide boards are used where plates join, a strip of asphalted board being placed underneath the joint. A ⅜ in. thick layer of mortar is applied in two coats, care being taken to thoroughly fill the dove-tailed grovoes. Where much vapor is formed, as in laundries and distilleries, the plates should be rendered with cement mortar, but for stables, kitchens, and dwelling houses the first coat may consist of lime mixed with cement, and the second of lime-mortar. Ceilings protected with these dove-tailed plates are fairly fireproof, and transmission of sound is considerably less than with ordinary material.

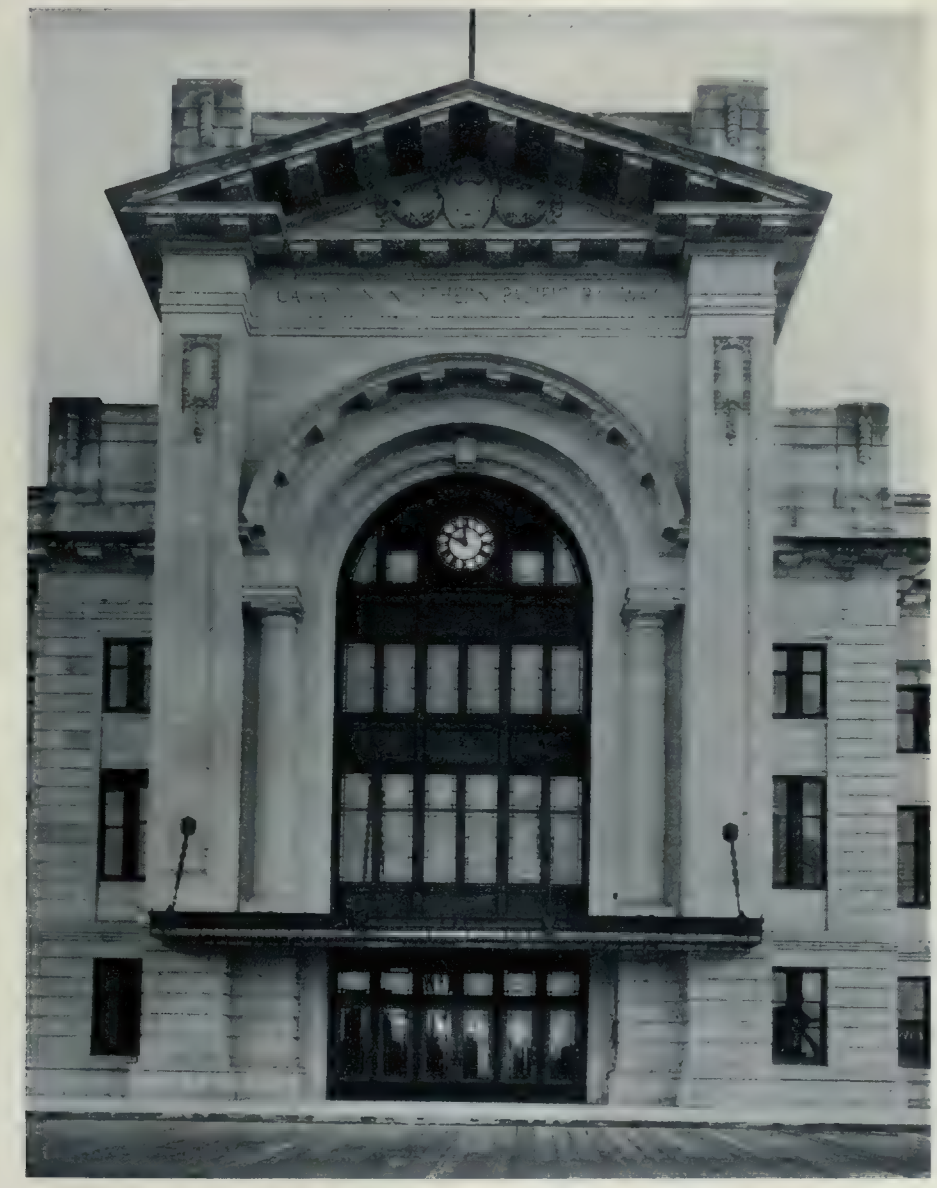
New Canadian National Terminal, Vancouver

THE City of Vancouver was originally laid out on a peninsula, two thousand feet in width at the narrowest part and widening out to an average width of about six thousand feet. On the north, and fronting the city, is the harbor known as Burrard Inlet, very narrow at the entrance and about two miles wide within the harbor. On the south the peninsula is bounded by an estuary known as "False Creek." This ran inland from English Bay, for a distance of over three miles, and had an average width of half a mile. One mile from the eastern or inland end, this estuary narrowed up to about 750 feet and then widened out to a basin of about 3,200 feet in width, which was merely a tidal flat, fed by several creeks at low tide, and entirely submerged at high tide.

Across this narrows, there was a pile bridge on what is now known as Main street, and over this bridge the stage coach from New Westminster used to roll, after bumping over the twelve miles of "corduroy" road which lay between the two towns. At that stage of Vancouver's development, False Creek was only used as a "booming ground" for the sawmills, and as a swimming hole for schoolboys.

As the city expanded, the peninsula became too small and the growth extended eastwards to the mainland, and southward across False Creek, along the Westminster road to Fairview and to the residential districts of Shaughnessy Heights, Kitsilano, and Point Gray, leaving the old tidal flats of False Creek in approximately the geographical centre of the city.

The Canadian Pacific Railway had entered the city along the harbor front, and naturally controlled all dockage and warehouse sites along the water front, in addition to which they had



DETAIL OF ENTRANCE, NEW CANADIAN NATIONAL RAILWAY STATION, VANCOUVER, B.C.
PRATT AND ROSS, ARCHITECTS.

GENERAL WAITING ROOM, NEW CANADIAN NATIONAL RAILWAY STATION, VANCOUVER, B.C.

constructed a spur line across the narrow part of the peninsula and along the north shore of False Creek. New industries were seeking sites on which to locate, and the Dominion Government undertook the dredging and reclamation of False Creek, from English Bay to the Main street bridge.

About this time the Canadian Northern Pacific Railway (since incorporated in the Canadian National Railway) was seeking an outlet to tide water, and in 1913 an agreement was entered into whereby they secured a portion of the tidal flats lying east of Main street. The Northern Pacific and Great Northern had previously secured a U-shaped area around the edge of these flats on False Creek, leaving an area 1,600 feet wide and 4,500 feet long comprising 162 acres. The City of Vancouver transferred to the C.N.R. under agreement 127 acres, reserving the balance for streets and park sites.

In addition to filling the area for its own and the city's use, the railroad was required to extend the fill 150 feet west of Main street to a sea wall, which it was also required to construct. This feature of the project entailed an expenditure of $750,000 for the release of riparian rights. The agreement between the city and the Canadian Northern was founded on a plan of the Vancouver Harbor Commission, contemplating the future construction of a public railroad connecting the two railway terminals with a public dock, to be located on the Kitsilano Indian Reservation. The filling of the submerged land involved over 5,000,000 cubic yards of material. A large sewer has also been constructed to drain the terminal property and intercept city sewers which hitherto drained into the basin. The sea wall west of Main street is finished, and the station and outbound freight house, 800 feet long, have been completed.

The material for making the 15-foot fill, was obtained from the dredging operations in False Creek, and was deposited on the site by hydraulic fill, after being pumped through some two miles of steel pipe line.

Plans for the freight shed and freight offices were completed in September, 1916, and contract awarded in October, 1916; and the freight sheds turned over for use in March, 1918. The contract for the station was awarded in July, 1916, and work actually commenced on January 2nd, 1917.

In the meantime the railway company had

NEW CANADIAN NATIONAL RAILWAY STATION, VANCOUVER, B.C. PRATT AND ROSS, ARCHITECTS.

built a temporary loose rock dam, across False Creek under the Main street bridge, having been delayed in the construction of the sea wall, by legal proceedings with reference to riparian rights. They also constructed the big trunk sewer and tide gates, carried up the hydraulic fill, and laid construction tracks to the freight sheds.

Investigations and borings were carried out in connection with the foundations for station, and a suitable hard pan was encountered at a depth of about 40 feet. This was overlaid by boulder clay, gravel, sand, and about 25 feet of black "muck" consisting largely of decayed vegetable matter and light silt. In order to give lateral support to the foundation piles, it was decided to compact the silt by bringing the hydraulic fill at the station, and for an area of 100 feet all around it, up to an elevation well above high tide. The weight of this fill displaced a large portion of the silt, and penetrated the balance in layers at an inclination of about 15 degrees from the horizontal, thoroughly compacting it. As the hydraulic fill was composed of fine gravel, this furnished an excellent support for the piles. The piles were then driven and the fill excavated for the foundation piers and walls, pile "cut off" being below the elevation of mean low tide.

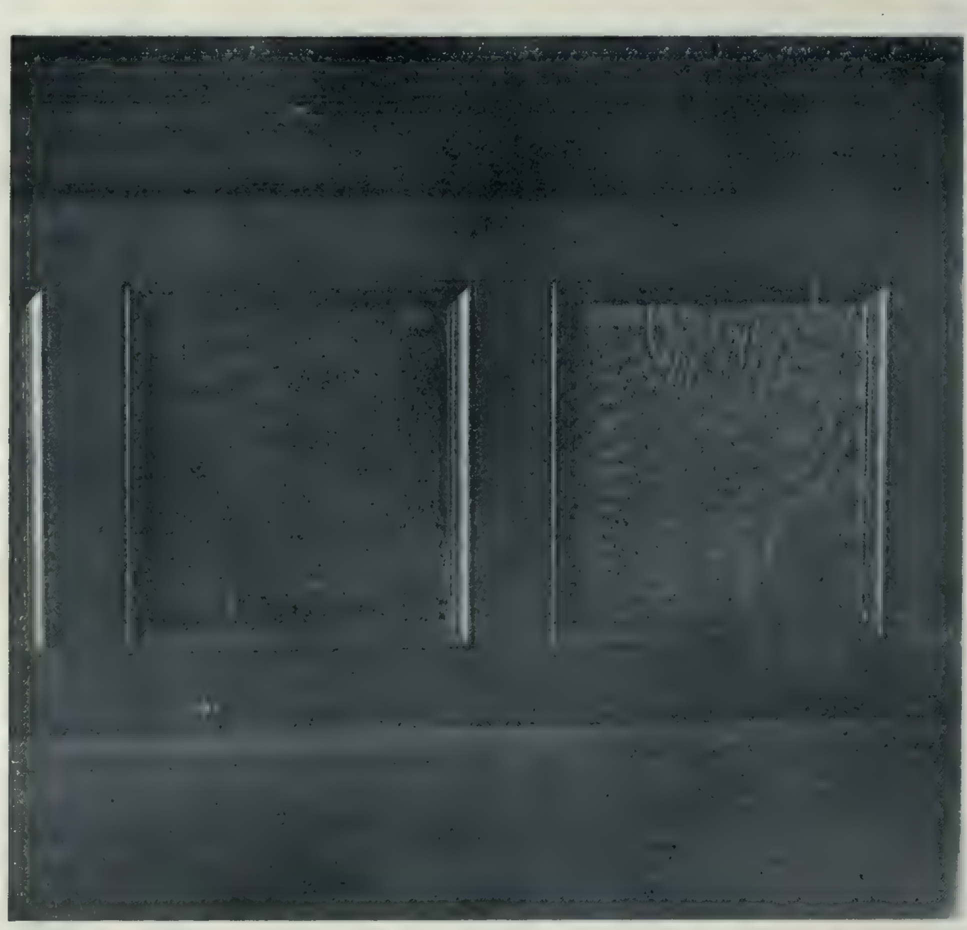
Concrete columns were carried up from the pile capping to basement floor level, and the basement floor designed as a flat slab, reinforced to allow for possible further settlement of the soil underneath, and also reinforced on top of slab, to provide against hydrostatic pressure from water in the soil. A five-ply felt and asphalt waterproofing course was laid on this slab, carried through the exterior walls, and up the outside of the foundation walls to finished grade. Over this waterproofing a 3-inch wearing floor of concrete was laid. This has proved highly satisfactory, and no seepage has developed, although subsequently when the fill was being completed, there was a hydraulic head of 20 feet against the floor of the boiler room.

The freight terminal occupies the centre of

TRAIN SHED, NEW CANADIAN NATIONAL RAILWAY STATION, VANCOUVER, B.C.

the terminal area with a team yard in the southern portion. The freight house layout consists of an office building 100 feet by 50 feet and two freight warehouses—an inbound freight house 50 feet wide and an outbound freight house 40 feet wide—with provision for an ultimate length of 1,600 feet for each house. The freight houses are to be served by six house tracks, arranged in groups of three with a transfer platform in the centre.

A section of the outbound freight house, 40 feet by 800 feet, has been completed. This has a steel frame with steel roof trusses supporting wooden purlins which carry a 2-inch plank roof finished with tar and gravel roofing. The floors are of heavy timber construction. Along the track side of the building, the doors are continuous, but on the team side, they occur only in each alternate 16-feet bay. Along the entire length of the building above the door head, continuous glazed transom lights are provided, while the wall portions consist of ⅞-inch sheathing on both sides of the studding, covered on the outside with corrugated iron. Three 13-inch brick fire walls divide the house into four compartments. A cold storage room is located at the east end of the building, a customs office near the centre, and accommodation for the clerks and truckers at the west-end of the building.



WALL PANELS SHOWING USE OF B.C. FIR IN NEW CANADIAN NATIONAL RAILWAY STATION, VANCOUVER, B.C.

CONCOURSE AND TRAIN SHEDS.

The concourse, at the rear of, and adjoining, the station building, is 337 feet long, and 40 feet 8 inches wide, the floor being of reinforced concrete slab construction, carried on piles. The roof which is about 19 feet 6 inches above the concourse floor, covers an area 307 feet x 40 feet 8 inches, and is supported by the rear wall of the station, and columns at outside edge of concourse, respectively, a slight fall towards the columns having been given, to take care of surface water, which is carried to drains, through the downspouts at columns. These columns are carried on pile foundations, placed at intervals of 46 feet 1¾ inches along the concourse, and are of reinforced concrete construction, as is also the concourse roof slab. Natural light to the concourse is obtained by a roof light 21 feet by 21 feet, placed in each bay, between the column centre lines. A ventilator is placed in each of these roof lights.

The two wooden platforms of train shed included in the initial installation are 16 feet wide and 900 feet long. They are carried on piles, and are placed at 45 feet centres, with two sets of rails between them. Between these two sets of rails are placed the columns supporting the beams carrying the roof slab over the train platforms.

At a height of 19 feet and directly over the train platforms is a slab 20 feet wide and 900 long, forming the roof covering for the platforms, the remainder, viz., above the rails, being left entirely open, with the exception of the cross beams, which, supported by the columns, are 30 feet apart. This construction permits the escape of steam and smoke from the locomotives.

A complete system of electric lighting has been installed on both concourse and platforms, controlled from the concourse, with separate switches to the different portions of the concourse and platforms, allowing of the illumination of portions as may be required. A telephone system has also been installed, with outlets at various points along the platform, for the convenience of railway officials. Steam, water and air feeders have been carried the full length of the platforms, for the replenishment of cars, while standing on the platform tracks.

STATION.

The station has a frontage of 321 feet by 105 feet in depth to the concourse, and is three storeys high above grade. Reinforced concrete and tile construction was used throughout, and as far as possible, construction material of local origin was used.

The design is an example of modern classical architecture, embodying a free use of the Doric order. The central feature is a large arched doorway, adequately expressing the spirit of the building as a "gateway" to the city.

In developing the design, the need for ample light in the offices had to be kept in view, and the results are such that all office spaces and corridors are well lighted. The main waiting room, in addition to clerestory windows on three sides, is lighted by three large ceiling lights with lanterns above.

The main archway is 21 feet in width and 52 feet in height to the centre of the arch. It contains the entrance doors, above which is an ornamental iron window three storeys in height. The arch is surmounted by a pediment having a projection of five feet. The massiveness of this pediment may be appreciated when it is stated that the keystone of this arch weighs 30 tons.

On each side of this main feature the facade consists of seven bays divided by six Doric columns 3 feet 1½ inches in diameter by 40 feet 8 inches high; while at each front corner there is a secondary feature, having two columns of the same order introduced. The treatment is repeated at the ends of the building. A marquise of ornamental iron with wire glass panels, overhangs the front entrance, as well as one at the baggage and express doors at either end.

Six entrance doors give access to the vestibule which is separated by a second set of doors from a lobby 28 feet by 40 feet. This lobby opens into the general waiting room, and on the right hand side of the lobby are located the elevator, hall and stairway to the upper floors.

The general waiting room is 48 feet by 150 feet and 28 feet in height. At the right hand corner of the lobby, as you enter, is the information bureau, and beyond that, in order, are the Y.W.C.A., barber shop, men's waiting room and toilets. To the left of the lobby are the women's waiting room, 30 feet by 54 feet, with retiring room and toilet room, and beyond that in the north-west corner of the building the dining room and lunch counter.

The north end is occupied by the baggage room, and along the east, or track side of the waiting room, are arranged the ticket offices, the lobby leading to the concourse through ten doors, the first aid room, news and drugs stand, and parcel checking room. The ticket offices have five booths with ornamental iron grilles.

The baggage room is 44 feet by 82 feet, and has a mastic floor. The baggage checking counter, baggage transfer office and the customs office, are available for the public off the waiting room, and provision is also made for hand baggage room and bonded warehouse.

The south end of the station is occupied by the Express Company, their office being entered from the south-west corner of the building, while the Government mail room is located in the south-east corner, adjoining the concourse.

In the basement are the boiler room, locker rooms, toilets and baths for the help; kitchen and store rooms for the dining room; machinery room, dining and sleeping car supply rooms, record vaults, and general storage.

The upper floors are used for executive and general offices in connection with the railway service, and janitor's quarters are located in the tower over the main entrance archway.

All floors in public spaces, toilets, and corridors, are of terrazzo; the toilet walls have a tile dado seven feet high.

In the lobbies and general waiting-room, Missisquoi marble base is carried to a height of six feet, with Caen stone cement finish above. Ornamental pilasters, beams, and cornice of a simple classical design are used. The stairs to first floor have marble treads and risers, with oak handrail on ornamental iron balustrades. Above the first floor, stair treads and risers are of terazzo. All stairways are formed of reinforced concrete.

The elevator enclosures are fireproof, and have ornamental iron grilles with polished plate wired glass. The doors and trim, other than marble, on the ground floor, are of quarter-cut oak, while in the upper floors B.C. fir is used entirely. The floors of all offices are of concrete, with battleship linoleum cemented to the

(*Concluded on page* 66.)

What Is Regional Planning?

By Thomas Adams.

A resolution passed at the last American City Planning Conference drew attention to the importance of regional planning, and to the fact that data had been collected by numerous government departments which could be used in connection with the study of regional planning, and appointed three members to study and report "upon practicable means and methods of instituting regional planning activity either through existing or new agencies."

What is meant by "regional planning" as distinguished from "city planning"? Sociologists use the term for large geographical areas which correspond to states or counties. It is obvious that such a term as "region" may be made applicable to widely varied kinds of area. In determining what a region should be for purposes of planning, we should have in mind the limited area which it is practical for any man or group of men to properly plan in one operation. Moreover, we should have in view what is the dominating feature which makes the said area appropriate as a unit for planning. It is the industries of a district which should influence the determination of regions for purposes of planning. An arbitrary city boundary is not a satisfactory planning unit unless it be in the case of a city that is practically stationary in development.

A French writer says that in general acceptance what we mean by "regionalism" is the development of industries and commerce of a region. When we add the word "planning" to "regional" we imply that the industrial region is not too large to at least plan a skeleton of the main lines of development, such as arterial highways, main transportation systems, etc. I think the groups of regions to have in mind are:

(1) An industrial area having problems and conditions in common and comprising incorporated areas, or parts of incorporated areas, adjacent to one another;

(2) An agricultural region round a market town or village, where the problems of town and country are so intermingled as to require treatment in one comprehensive scheme;

(3) A mining region, consisting of a series of villages in a large coal bearing or other area where the industry dominates the whole development;

(4) A metropolitan region where a large city has thrown out a number of satellite towns or suburban districts or has overgrown its boundaries.

These are some instances of the kind of region which should be studied and planned in skeleton before we prepare city planning schemes for the administrative areas within the region.

The order in which planning should be done would be:

(a) Regional survey of social, industrial, and other conditions;

(b) A regional plan, showing tentative proposals for main highways, extensions of highways, general position of districts for industry and residence giving some indication of height and use of buildings, etc.;

(c) A definite city or town plan, going into detailed development subject to general conformity with the regional plan.

Where necessary, the city plan might be preceded by a further survey to be called the "civic survey" as supplementary to the regional survey, but dealing only with the incorporated area.

The objective should be to adapt the area to the planning rather than to attempt to adapt a plan to an unintelligible boundary of an incorporated area. By these means we shall simply be adopting the British and German idea that we should plan the environments of a city at the same time that we attempt to deal with the improvement of the existing city. The German plans deal with town extension rather than with town reconstruction. The British plans deal primarily with areas unbuilt upon. American city planning and zoning schemes have been too much confined to areas already developed and should broaden out to deal both with developed areas and with undeveloped areas including those that grow out from one common centre and are likely to undergo development in the future. Modern transportation and methods of power distribution are forcing us to adopt new geographical areas for planning. The industrial region, whether it be the metropolitan area or manufacturing district, or mining district, or an agricultural area with a central focal point, afford the best scope for preparing a regional scheme.

The suggestion is that this regional scheme should merely be a tentative one as the basis for the civic plans to be prepared for each administrative unit within the region. It is also the proper area for carrying on research and surveys of conditions. Joint action by the councils of incorporated areas within an industrial region, in preparing the regional survey and tentative plan should be taken as a preliminary step in city planning.

The Building Industries Conference

THE conference of the Association of Canadian Building and Construction Industries at Ottawa, February 2, 3 and 4, was altogether a representative meeting having an important bearing on the interests of the industry. It succeeded in bringing representative contractors, builders and supply men together from various parts of Canada for a frank discussion of the objects of the association and the consideration of certain changes to the constitution and by-laws leading to the establishing of the association on a permanent organized and workable basis.

The meeting dealt with various questions affecting the industry—business relations, labor, standardization, unit prices, and straight contract and cost plus work, and as to how certain conditions which arise could best be met.

During the conference those in attendance had the opportunity of listening to a very ably presented address by the Hon. Mr. Rowell, President of the Privy Council, on the recent Washington Conference in reference to the eight-hour day.

Another speaker was Senator Robertson, Minister of Labor, who referred to what the Government has done in co-operation with the provinces, in establishing employment offices throughout the country which had provided positions for 226,000 men and women, including a very large number of returned soldiers. He felt that an association such as the Canadian Building and Construction Industries, if permanently organized, could be made a beneficial factor in establishing relations between employers and labor.

President's Address

In his address President Anglin reviewed the accomplishments of the association since its formation at the first conference which was held in Ottawa about fifteen months back. In the meantime a general secretary had been appointed, and a meeting of the National Council held at Toronto with good results. Considerable had also been accomplished in the organizing of contractors' bodies throughout the country. The association had been recognized as the representative body in the industry by the Federal Government. Six of its members sat at the National Industrial Conference at Ottawa last fall and worthily upheld the interests of the industry the association represented. Besides this other activities have been carried on both in committee and through personal efforts.

Proceeding Mr. Anglin stated that the conference should represent the spontaneous expression of the opinions and experience of those who had gathered together, and not be conducted along the set lines of the first conference. The chief objects, as he conceived them, for having any Canadian association whatsoever were (1) to reduce the difficulties that surround those engaged in the industry—contractors, supply men, and all; (2) to improve the practices current among them; (3) to fix standards which could be fairly and uniformly applied throughout the country; (4) to facilitate the movement and employment of labor, and, finally, (5) if possible, to work out some sort of a plan which would help in the production of building materials, and bring it up to the great need which exists at the present time.

Business, Mr. Anglin said, outside of the industry, has in the past treated contractors more or less as a joke, and finance, as represented by the banks, has put us almost at the bottom of the ladder. The successful contractors ultimately failed unless they retired at an opportune time, and it was up to the contractors themselves to so improve conditions that this sort of thing would not continue.

"In the first place it should be the duty of all engaged in the industry to help the honest, straightforward and legitimate contractor and material man, and to make it difficult for the unsound firm lacking either in experience or strong financial conditions to engage in the business. Make the industry, if possible, one that will be entered into by worthy men and worthy men alone. Certainly we cannot accomplish this end by the usual underhand and so-called cut-throat practices in the past; certainly not by the free-for-all, or every-man-for-himself, disorganized industry, which has prevailed hitherto.

"To attain the end desired it is necessary to increase efficiency, to lower costs and, if possible, to establish for our industry regular and steady earnings. After all, we must always look to that end if we are to be successful. We can no longer localize our organizations. The operations of all the larger general contractors, trade contractors, supply houses and building material manufacturing concerns cover many cities and towns, several provinces and, in some instances, the whole Dominion. Provincialism, therefore, is not the basis for our organization, as I see it. . . . . If organization has any value to the broadminded business man, it must be Dominion-wide, it must be centralized and efficient, and it must be properly founded and sufficiently financed.

Asking if it was worth while to endeavor to accomplish this, and as to what would be the real benefits and unseen advantages of such an organization, Mr. Anglin maintained that in the first place "the fraternity that one has with his competitor is worth the price in itself; in fact, nothing has given me more satisfaction or pleasure than the acquaintanceship of men who are engaged in the same line of business or the opportunity to discuss the problems, difficulties and troubles and to compare results with those whose calling is the same as my own.

"This fraternity leads to a second advantage, and that is co-operation of effort. There must be co-operation where there is the proper kind of fraternity. Co-operation in itself will lead by the comparison of experience and notes, to increased efficiency in methods of doing business, and increased efficiency in methods will certainly lead in the direction of stabilizing our industry—stabilizing our own particular business and stabilizing the business of those we come in contact with. As a result of that we will be in a position to render the service which the country really demands that we should render. . . . .

"Are we prepared and are our confreres at home prepared and willing to back us if we organize this association on a sound basis? We should bear in mind that this construction industry, no matter what part of it we are engaged in, is, after all, our chosen life-work, and demands the very best we can put into it. If we do that Canada may ultimately receive our help and support.

"Now, with respect to action. It is all very well to think high ideals and all the rest of it, but they are not worth as much as they should be unless we get down to definite action. We have obtained our charter, but we need to put the finishing touches on the constitution. We must determine the classification and kinds of membership, and we must also determine the relations between the various existing national bodies and between the local bodies in the various parts of Canada and our federal body. There are quite a number of national bodies already in existence, such as the heating and the domestic sanitary engineers, the National Clay Products Association, and others. Shall we organize, and if we decide to organize, shall we organize as a number of associations leading up into one large federation."

Mr. Anglin then went more fully into the question of organization, the best method of financing the association, and as whether the association should maintain a permanent office and secretary, dealing incidentally with the subject of standard wages and as to how long trade agreements with labor should run. Reference was also made to the possibility of establishing a central bureau in Ottawa, or elsewhere, with a view to facilitating the movement of labor in co-operation with the machinery already set up by the Department of Labor, and whether in view of the present shortage of labor it would be possible to obtain co-operation through the Immigration and Labor Departments in supplying the needs of various districts. He further asked as to what extent the association was prepared to devise or work out a sound and attractive apprenticeship or scheme for technical training, and the attitude of the conference towards international unions and other labor organizations, as to whether it considered the industrial council the best method of determining agreements, and if the principle should be extended.

Regarding the discussion going on throughout the country about low production, Mr. Anglin felt that if something was started the other way which would have less of the element of criticism to it, it would have a beneficial effect.

There was also a need in all localities for some counter demand on labor. Labor always had their demands well formulated, and it was necessary for employers to work out some standard of service, setting forth what is expected of labor in return.

As regards materials, the greatest need was for better arrangements for the supply of materials. This did not refer, Mr. Anglin said, so much to raw material, as to manufactured products. The association should have a wholesome regard for its membership, and for those who stand high in the industry and are ready to support one another internally. Special trade discounts within the organization were the association's rights, and in return the suppliers of materials who support the association should be given better consideration.

There was also the question of the relation between the trade contractor, the architect and the engineer. The trade contractor who quoted the same price to the architect and the engineer as he did to the general contractor, was hastening his own doom. There should be some fair and equitable standard of procedure which would give the trade and sub-contractor a square deal.

Mr. Anglin concluded his address by advocating a more constructive policy of propaganda in order to better conditions and to remove the difficulties ahead. Canada, he said, as far as the building industry was concerned was fully a decade behind in organization, and that there was urgent need for a Dominion-wide association such as the attempt was being made to bring into existence.

Labor and the Industries

Following Mr. Anglin's remarks the vice-president, Mr. Fred Armstrong of Toronto, addressed the meeting, stating that with Mr. Anglin, he had the honor of attending the Industrial Conference at Ottawa, and was struck with the fact that the construction industries were far behind in formulating plans to counteract the fact of labor propaganda and organization. "Labor," he said, "had spread its operations to every part of Canada and had divided the country into zones with regulations which apply to every section, from the Atlantic to the Pacific." He felt that if the conference were to do anything effective, that might help the building industry, it was necessary to include in its program something which would protect the interests of those the association represents.

Progress of the Construction Industries in the United States

A prominent visitor at the conference was Mr. J. C. Frazee, secretary of the National Federation of Building Industries of the United States, who gave a most interesting and illuminating address, based on the experiences and accomplishments of the organization which he represented.

Mr. Frazee explained that in Canada, the United States, France and Great Britain and Germany, there had been a spontaneous movement towards organization of the construction industries as a whole about the same time. Consequently no one country could take credit for having conceived the idea of amalgamating all these industries. The greatest promise of the success of the venture lie in the fact that in at least five countries the conception appealed to the hard-headed business men of these countries simultaneously.

After defining the word "construction," which he said took in architectural and engineering projects and everything relating to them, including every type of building erected, railroads, bridges, viaducts, dams, irrigation systems, etc., the speaker declared that it was significant that the construction industry produces capital wealth as distinguishable from consumable wealth. The construction industry in the United States produced normally $3,000,000,000 annually in permanent, taxable wealth that is not consumed as is coal, food, clothing and innumerable other products classified under consumable wealth. In any country it was the largest industry, producing more wealth and having more widely disseminated activities, than any other industry with the exception of agriculture. Connected with it were the producers and refiners of raw materials, the mines and quarries, the manufacturers who converted the raw materials into the finished products, the wholesale and retail distributors, the general and sub-contractors, the architect, the engineer, and last but not least, the financier. Besides this, its ramifications extended to the wages paid to its vast armies of employees, and which had an economic bearing which is felt and reflected in all other lines of business.

CO-OPERATION VS. COMPETITION.

Referring to the change which is taking place, Mr. Frazee went on to say that "there was a time some years ago when the individual business man believed in standing absolutely alone. He was in competition with other men in his line of activity and was somewhat opposed to the thought of forming business associations where he would deal with his competitors in a co-operative rather than a competitive way. Then some one coined the happy phrase, 'Competition is war—and war is Hell,' and I think that had a good deal to do with the establishment of organizations in the United States. Such organizations are not for price fixing purposes, in opposition to Federal laws, but for the furtherance of the interests of the industry along perfectly legitimate lines. At any rate in the past ten or fifteen years there has been a marked change in the sentiment of the individual business man, and he has become persuaded in the main that it is a better policy to co-operate through business organizations than that he and his competitor should try to cut each other's throats. In that way there has grown up in the United States a very large business organization in the construction industry—some hundreds of associations having to do with special construction activities. . . . The result is that there are national associations, regional and state associations and local associations, to the number of some hundreds, all of which are dealing with one or another phase of the construction industry.

"There has been up to the present time, and there still remains to some extent, the same type of competition between associations that there was between individuals. Specifically, the cement interests and the brick interests feel they are most serious competitors, and the triangle is completed by the lumber interests. Thus there is a condition at the present time where the feeling which formerly existed between individuals now exists between the associations, and the next logical step is to obtain a co-operation between all of these through a central organization."

This idea of central organization, Mr. Frazee continued, appealed with tremendous force at the end of the war to the thinking element in the five countries mentioned. He then went on to outline the attempt made by the United States Government through the War Industries Board to deal with all construction industries, of the subsequent request which it was necessary to make to the Chamber of Commerce, due to the complexity of the situation to organize the entire industry into one body, how this brought the National Federation of Construction Industries into existence, and of the decision which was made following the armistice to re-organize along permanent lines.

The objects of the U.S. Federation, which is to co-ordinate the various divisions of the industry, were set forth by Mr. Frazee as follows:

To promote closer co-operative relations between producers, manufacturers, distributors, contractors, architects, engineers, realtors, financiers and other construction interests; to develop and preserve satisfactory conditions in the relationship of the combined industry to the general public, including the Government, labor and consumers; to serve as an exchange between and common meeting-place for associations representing special construction interests. In cases where a special construction interest is primarily concerned, to support the initiative of the representative association in all matters considered by the Federation to be within the proper scope of its activities; in cases of common interest to the construction industry in general, to take the initiative in investigation, policy, propaganda, legislation, and in such other ways as will benefit the industry; also to provide a united organization which will mobilize the entire strength and experience of the industry.

In the United States the country is being divided into twelve Federation districts, each of which will elect one member to the Board of Directors which will, in addition, comprise thirteen members elected at large. There is also an Advisory Board at present comprising 147 members, to which any national association belonging to the Federation is entitled to appoint two members. Representation is also granted on the Board to a member of each Federation district and to regional association members, each of which can appoint one member at large and as many district members as the activities of an association extends into, and to local associations confining their activities to one city, who may elect one district member to the Board. This Advisory Board has the power to elect such other members as may be deemed advisable, not necessarily confining themselves to the construction industry. Its function is to take into consideration and to analyze any matter on which the Board of Directors wishes to take action, giving it the attention of its full membership, and subsequently its findings are laid before the entire membership of the association through the mail.

Mr. Frazee advised the construction industry of Canada to get the assistance of the big men of the country, whether they were connected wtih it or not. The effect of the industry was so great upon industry in general that any good business man was glad to help. He also referred to the intention of the U.S. Federation to organize a staff council of paid men of the various associations connected with it, with the object of avoiding conflict in seeking legislation, such as occurs when one industry petitioned Congress for one thing, while another industry sought something totally different.

BENEFITS OF ORGANIZATION.

As regards the advantages of organizing the industry as a whole, this was evident in the benefits brought about in the United States in a comparatively short time, largely, if not entirely, through the efforts or representations of the Federation in that country in the way of large road building programmes, involving on the part of the Federal Government alone an expenditure of $500,000,000, the "Own your own home" campaign, the "Build now" campaign which has given a big stimulus to the industry. The Federation had also rendered important assistance to the financial situation when loans were difficult to obtain prior to floating of the Liberty Loan, through representations to the Secretary of the Treasury, who issued instructions to bankers to accommodate legitimate construction undertakings. Besides this, it has conducted an educational campaign regarding permanency in price level and the improbability of building costs declining, brought about a reversal of decision in the railroad administration, effected the settlement of wage and labor disputes, and has been instrumental in having a bill introduced for the relief of contractors whose contracts were cancelled by the Government at the end of the war.

While little had been accomplished up to the present in the way of standardization, Mr. Frazee said that the Federation had a comprehensive progamme going into the standardization of the industry in its engineering, commercial, legislative and business aspects. From the standpoint of materials this standardization would seek to have more work done in the shop and less at the site, and thereby increase output and reduce costs. The speaker summarized his address by stating that the organization of business along proper lines was not a menace to Government, nor to labor or anybody. There were always some short-sighted individuals who would do the wrong thing with respect to labor or prices, but if there was a strong organization with the best brains behind it—and remembering that only a small percentage of business men were rascals—conditions were going to be better than worse, because the tendency of the few would be curbed by the organization. To effect such organization representing the construction industries as a whole, it was necessary to realize that two things were essential—money and service. First it was necessary to have money in order to have an organization, and secondly it was necessary for members willing to serve on committees, and it was also necessary to see that the committees were run so that they did not go to seed.

Committee Reports

REPORT ON CONSTITUTION AND BY-LAWS.

A report was submitted by the Committee on Constitution and By-laws recommending that the membership be divided into two classes, "Individual" and "Collective," and that fees for each class be fixed at $25.00 per annum. The term "Individual" was defined as any individual firm or corporation engaged in any branch of the construction industry, and the term "Collective" as any group of individuals firms or corporations engaged in any of the building industries, either local, provincial or national, such as builders exchanges, trade associations, etc. A "Plural" membership is also provided giving any individual or collective member the privilege of obtaining multiple memberships. It was recommended that existing organizations, and all new organizations formed, resolve themselves into branches of the association under the regulations laid down for collective members, so that the country may ultimately become organized into local groups which would in turn form provincial groups and these in turn elect an equal number of official representatives, who, combined, one province with the other, would form the national council consisting of the executive of the association and three councillors from each province.

REPORT ON BUSINESS RELATIONS.

A report on business relations was also submitted and adopted, making the following recommendations:

"That a standing committee be formed to take up the whole subject of Business Relations:—(1) between the general contractor, architects and owners; (2) between the general contractor, sub-trades and supply houses; (3) between the sub-trades, supply houses, architects and owners."

It is also recommended that the committee get in touch with all branches and exchanges throughout Canada with a view to obtaining an expression of opinion, and that a subsequent report be prepared and submitted to the National Council of the Association for whatever action may be deemed necessary for improving business relations.

The report further suggests as a matter of guidance to the committee that the following be considered:

"(1) That all members of this association, whether through branches or directly, shall bind themselves to deal as far as possible only with the association.

"(2) That some system be worked out whereby the general contractor shall be protected in return for his undertaking to deal only with the association.

"(3) That the uniform contracts, which it is hoped, will become universal when they are drawn up, shall include a contract form between the sub-contractor, the supply house and the general contractor now in use in Winnipeg, to specially protect the sub-contractor and supply houses as to their payments being made promptly."

REPORT ON STANDARD PRACTICE.

Forms of tenders and bids, unit prices, standard forms of contract, penalties and bonuses, and straight contract and cost-plus work were dealt with in a report presented by the Committee on Standard Practice, setting forth the following recommendations:

"(a) That no sub-division of tenders or unit prices be given to architects or engineers before the contract is closed, or before written assurance has been received that a contract will be entered into.

"(b) That architects and engineers be notified that general contractors will not submit bulk competitive tenders where the said architect or engineer is at the same time taking bids on his work by trades.

"(c) That the practice of giving certified cheques with bids, both on private and public work, be strongly discouraged, and it is suggested that in view of the large deposits which have to be made by bonding companies with the Provincial and Dominion Government, that bid bonds be substituted.

"It is recommended that a committee be immediately formed consisting of three responsible archiects appointed by the Royal Architectural Institute of Canada, and three members of this Association, and that legal advice be obtained by the architects on the one hand, and this Association on the other, to co-operate in drawing up a standard form of contract and general conditions which can be used throughout the Dominion.

"Further, that a standard form of sub-contract be prepared, which form should bind the sub-contractor to the same conditions of contract as the general contractor, and assure the sub-contractor of the same privileges and conditions as accrue to the general contractor.

"Inasmuch as architects and engineers invariably reserve the right to dismiss any contractor for incompetency, it is recommended that penalty and bonus clauses should be eliminated entirely from construction contracts.

"It is recommended that lump sum contracts be strongly discouraged until existing conditions become more normal, and that the 'cost plus a percentage' or 'cost plus a fixed or sliding fee' form of contract be advocated as the only fair and reasonable basis, from the viewpoint both of contractor and owner, and that a resolution to this effect be immediately forwarded to the Dominion and Provincial Governments, and municipal bodies, and to all architectural and engineering bodies interested."

This report was finally adopted with an amendment to enlarge the representation on the Committee of Standard Forms of Contract to include two members of the Engineering Institute of Canada, the committee to consist of two engineers, two architects and four contractors, instead of three architects and three contractors as originally proposed.

The conference also approved of the resolution adopted by the Ottawa branch requesting the prompt opening of all public tenders and the awarding of the contract thereafter as soon as possible, and that the cheques of unsuccessful tenders should be returned within a week's time or otherwise bear 6 per cent. interest.

REPORT OF LABOR COMMITTEE.

The report of the Labor Committee was prefaced by an explanation to the effect that the problems arising out of the consideration of the relations between the employers and the employees were too numerous and comprehensive to be covered even superficially in the limited time at the committee's disposal, and resulted in the adoption of the following recommendations:

"(1) Admitting as we do the right of labor to organize, we submit that this Association should urge that all labor organizations become incorporated in Canada, or otherwise be made responsible so that all contracts entered into between organized labor on the one hand, and individual or corporate employes or incorporated associations of employers on the other hand, shall be made binding upon each of the contracting parties.

"(2) That legislation be sought making compulsory the reference to a Board of Conciliation of all disputes which cannot be settled by the parties directly interested therein, before the employer be permitted to close down his business or the employees be permitted to call a strike.

"(3) That this Association adopt a policy of having such agreements as are entered into with the labor organizations expire on the 31st day of March, and that a clause be inserted in all such agreements requiring that any new agreements or modifications of existing agreements be executed at least three months prior to the date on which they become effective. Further, that the period covered by such agreements should be determined by the local bodies until the present abnormal conditions be over.

"(4) That this Association take up with the Dominion and Provincial Governments and the reputable labor organizations of Canada the matter of apprenticeship and trade tests along the following lines: (a) The institution of an apprenticeship system in the various trades whereby the apprentice would obtain a practical training under the supervision of practical employers, and at the same time a technical training of an examining board consisting of an employer, a labor representative and a Government representative, to examine the apprentice as to his mastery of his trade before giving him th rank of journeyman. (c) The conclusion of an arrangement whereby the Union would not admit new members to their organization until the qualifications of such new members had been passed on by the examining board mentioned above.

"(5) That when recommendation No. 4, as above, shall have been carried out successfully, this Association will make every effort to have the unions grade and classify their men using the machinery there set up to determine such grading or classification to the end that the incentive of its logical reward should be placed before the mechanics to encourage their increased efficiency.

"(6) That a standing committee or a paid official be designated by this Association to get action on these items as rapidly as possible, to the end that some of the objects here laid down may be reported to our next meeting as having been attained.

"That the matter of immigration of desirable mechanics be left with the incoming executive, to whom this committee is prepared to present a confidential report."

A motion was also carried by the conference supporting the principle that the Government should grant some measure of redress to contractors who sustained losses on federal work, owing to war conditions.

During the conference the general contractors held a meeting and decided to form the Canadian General Contractors Association, J. B. Carswell, Toronto, being elected president. The association was limited to firms who are organized and equipped and in a position to assume full responsibility for the erection of an entire building.

Mr. J. P. Anglin, Montreal, was again the choice of the conference for the presidency of the association. Others elected to the executive were: 1st vice-president, J. B. Carswell, Toronto; 2nd vice-president, James Mackie, Winnipeg; Secretary, James Phinnemore, Toronto; treasurer, G. A. Crain, Ottawa.

New Canadian National Terminal, Vancouver

(*Continued from page* 59.)

concrete. The corridors have terazzo floors with coved terazzo base and base blocks. The office partitions are of two types; the corridor partitions and partitions dividing one department from another, are of standard tile and plaster construction. The partitions dividing offices within a department area are designed of B.C. fir and Morocco glass, built in units, so that they may be removed and re-erected without damage to floors or ceilings. This permits of alterations being carried out with a minimum of cost, time and annoyance.

An electric clock system throughout the building is controlled by a master clock in the janitor's apartments. There are two clocks with five-foot dial, one in arch over front entrance, and another in the general waiting room; and ten secondary clocks located in positions convenient for the public and the operating staff.

KITCHEN EQUIPMENT.

The lunch room is 30 feet by 67 feet with dining tables and lunch counter. The lunch counter is equipped with tea and coffee urns, milk refrigerator, display cases, etc. Behind the lunch room is the servery, with refrigerators, steam table, gas stove, roll warmer, plate warmer, and china cabinets.

The kitchen in the basement is connected with the servery by means of a stairway and two motor-driven dumb waiters. The refrigerator room has separate compartments for fish, meat, fruit and vegetables. The bakeshop is complete with oven, and is partitioned off from the kitchen. Kitchen equipment includes vegetable peeler and sink, pot sink, steam stock kettles and vegetable cookers, range, broilers, "Niagara" dishwashing machine, work tables, etc.

The total cost of the station building, with equipment, concourse and train shed, will exceed $1,000,000. The cost of the freight shed was $137,000.

◆

Architects Molesworth, West & Secord, Toronto, have moved their offices from the Kent Building to 43 Victoria Street.

CONSTRUCTION

A · JOURNAL · FOR · THE ARCHITECTURAL
ENGINEERING · AND · CONTRACTING
INTERESTS · OF · CANADA

H. GAGNIER, LIMITED, PUBLISHERS
Corner Richmond and Sheppard Streets.
TORONTO - - - - CANADA
M. B. TOUTLOFF, Editor

BRANCH OFFICES:
MONTREAL—171 St. James Street,
E. R. Milling, Representative.
WINNIPEG—336 Qu'Appelle Street,
F. C. Pickwell, Representative.
NEW YORK—505 Fifth Avenue.
H. M. Bradley, Representative.

CORRESPONDENCE.—All correspondence should be addressed to "CONSTRUCTION," Corner Richmond and Sheppard Streets, Toronto, Canada.

SUBSCRIPTIONS.—Canada and Great Britain, $3.00 per annum. United States, the Continent and all Postal Union countries, $4.00 per annum, in advance. **Single copies, 50c.**

ADVERTISEMENTS.—Changes of, or new advertisements must reach the Head Office not later than the twentieth of the month preceding publication to ensure insertion. Mailing date is on the tenth of each month. Advertising rates on application.

CONTRIBUTIONS.—The Editor will be glad to consider contributions dealing with matters of general interest to the readers of this Journal. When payment is desired, this fact should be stated. We are always glad to receive the loan of photographs and plans of interesting Canadian work. The originals will be carefully preserved and returned.

Entered as Second Class Matter in the Post Office at Toronto, Canada.

WESTON WRIGLEY, Business Manager
FRED. T. HOLLIDAY, Advertising Representative

Vol. XIII Toronto, Feb., 1920 No. 2

Ontario Architect's Association Pursuing Active Policy

It must be said that since the convention last fall, the Ontario Association of Architects has been pursuing an active policy in reference to the affairs and interests which it represents. One of the signs of new life in the association is the fact that fees can no longer remain unpaid for several years before a member is dropped. This decision was reached at a recent meeting of the Council. While there was some excuse for arrears during the period of the war when things were more or less disorganized, it is now felt that any further postponement of dues is entirely unwarranted, and that in order to retain membership standing those who have been neglecting their annual payments will from now on be expected to remit promptly.

Another matter which the Council has before it is the report of the committee embodying recommendations on which an increase in architectural fees will likely be adopted, the proposed new schedule being so drafted as to be simple in form and eliminate all superfluous wording.

Moreover, attention is being given to a number of matters of public interest. As recently pointed out in the daily press, steps are being taken by the association to interest the Rotary Club and the Kiwanis Club and the local branch of the Manufacturers' Association in the suggestion recently made that the present was an opportune time for the development of the Toronto Exhibition Grounds to be taken up. It is pointed out in this connection that the public service committee of the Board of Trade have endorsed the suggestion that a well studied plan for the growth of the grounds and buildings be prepared before the new Live Stock Arena is finally located.

Altogether the association seems to have an active executive at its head, and a continuation of the present policy is bound to lead to definite results.

◆

Canadian Architects and Canadian Materials

A letter recently sent out by President Herbert E. Moore of the Ontario Association of Architects, is timely and quite explains itself. It does not touch upon a new condition, but rather on the old one that within the last few years has become seriously aggravated and which with the existing adverse rate of exchange presents a somewhat new economic phase. The letter reads as follows:

To the Members of the
Ontario Association of Architects:

During the war there was considerable comment and discussion amongst architects concerning the use of imported materials and the employing of professional talent from the United States, in the erection of some of our principal buildings. Since that time, a great deal has happened to further accentuate conditions, namely:

1. Rate of currency exchange with the United States, which shows at the present time something like 12 per cent. against our money.
2. Various warnings by our educational authorities, urging the utilization of Canadian brains as well as Canadian material resources.
3. The effort of the Association of Canadian Building and Construction Industries for the use of Canadian goods, showing that the business interests are alive on this question.

Time and again architects are asked, "What are you doing in this matter?" and so far as one can see, very little has been attempted by way of sympatthetic effort. In some cases, individual efforts have been passively looked upon as an outburst of some crank, who either has an axe to grind or has some mistaken idea as to the possibilities of business in its relation to patriotism.

It would seem that this question has reached a vital point; one where we, as architects, should state our position, and I would therefore ask you for your views, with any suggestions you might have concerning the advisability of placing our association on record before the Government and the public, and an answer to the question, "What are we doing in our practice to help Canadian resources?"

Trusting to have the benefit of your views at your earliest convenience.

HERBERT E. MOORE,
President.

It is indeed somewhat of an anomaly when one considers that in Toronto at the present time there are several theatres in course of erection in which the matter of design and expenditure is entirely in the control of architects who are non-residents of Canada. Further that non-Canadian architects have been given the commission for planning the large addition to the King Edward Hotel; that in Petrolia, Ont., plans have been imported from across the line for the erection of large industrial buildings; that one of the largest departmental stores of Canada which recently made use of the advertising slogan "Buy Made-in-Canada Products" almost exclusively employs American architects. These are merely incidental to the many instances which could be mentioned of work carried out in Canada regarding which Canadian architects have been given no consideration whatever.

In view of what has frequently been said in these columns on this subject, Mr. Moore's letter requires little comment here. It relates to a matter which should receive the closest attention, both in and out of the profession, and it is to be hoped that it will lead to a full expression of opinion, so that united action can be taken with other interests in making representations to the Government.

The resume of Mr. A. Frank Wickson on the Architecture of Toronto, which is published elsewhere in this issue by permission of the editors of "The Lamps," the year book of the Toronto Arts and Letters Club, is not only interesting in itself but suggests a series of monographs dealing with the architecture of Canada's principal cities. These monographs could be prepared by local architectural bodies or someone belonging to them, and would not only be invaluable in pointing out noteworthy examples of both old and new work, but would serve as a short guide to students and visitors who might desire to personally acquaint themselves with the best which our architecture has to offer. A series of articles of the kind, we believe, would eventually result in rather a complete record dealing with Canada's architectural progress and development.

New Process in Sculpture

A process for producing bas-reliefs by photography is the fruit of the invention of an Italian scientist.

The basis of the invention is the property possessed by a film of chromium gelatin of swelling in proportion to the intensity of the light falling upon it. The swelling is greater with a low than with a high intensity, so that the light passing through a photographic negative produces upon a chromium gelatin plate a positive in distinct relief.

The transparency of an ordinary negative, however, is not truly proportional to the relief of the original model, but by an ingenious automatic device involving double exposure this difficulty is avoided and a negative is obtained having its lights and shades correctly graded to produce the effect of relief.

Toronto School Building Program

The Property Committee of the Toronto Board of Education has passed estimates for the completion of the 1919 building programme and for carrying out this year's building programme without any paring. All the additional accommodation provided was deemed to be absolutely necessary in view of the present overcrowding in many sections. The sum of $976,500 is needed to complete unfinished building work, while $2,767,720 is asked for the erection of new schools during the present year. It was also decided to set aside $100,000 for the purchase of a site for a new school in the Rosedale district. An additional item in the estimates is one for $20,000 to provide wash basins, liquid soap and tissue towels in each school for the use of pupils.

CONTRACTORS and SUB-CONTRACTORS

CARSWELL BUILDING.

General Contractors, Yolles & Rotenburg.
Concrete Work, Witchall & Son.
Reinforcing Steel, Trussed Concrete Steel Co.
Steel Sash, Trussed Concrete Steel Co.
Heating, C. A. Dunham, Limited.
Elevator and Hoist, Turnbull Elevator Co.

CRANE COMPANY'S FACTORY, MONTREAL.

General Contractors, Anglin-Norcross, Limited.
Ornamental Iron, John Watson & Son, Limited.
Metal, Metal Shingle & Siding Co.
Millwork, F. Tremblay & Co.
Cut Stone, The Quinlan Cut Stone Co.
Roofing and Sheet Metal, Douglas Bros.
Waterproofing, H. H. Symmes & Co.
Painting & Glazing, Alex. Craig, Limited.
Plumbing and Heating, The Garth Company.
Elevators, Otis Fensom.
Structural Steel, Dominion Bridge Co.
Reinforcing, Trussed Concrete Steel Co.
Hardware, James Walker Hardware Co.
Electrical Equipment, Canadian Comstock Co.

CRANE FLANGED FITTINGS

CRANE
LIMITED

HEAD OFFICE & WORKS
1280 ST PATRICK ST
MONTREAL

BRANCHES: Toronto, Winnipeg, Vancouver
SALES OFFICES: Halifax, Quebec, Ottawa, Calgary

CONSTRUCTION

March, 1920 Volume XIII., No. 3

CONTENTS

CANADA'S MILITARY HOSPITALS 71
By Capt. W. L. Symons, Architect in Charge of Military Hospitals.

DAMAGES TO FRENCH ARCHITECTURAL TREASURES 83

A SECRET OF BAD BUILDING 83

ONTARIO HOUSING REPORT 84
A General Summary Based on the Practical Application of the Housing Act, Since it Came Into Operation.

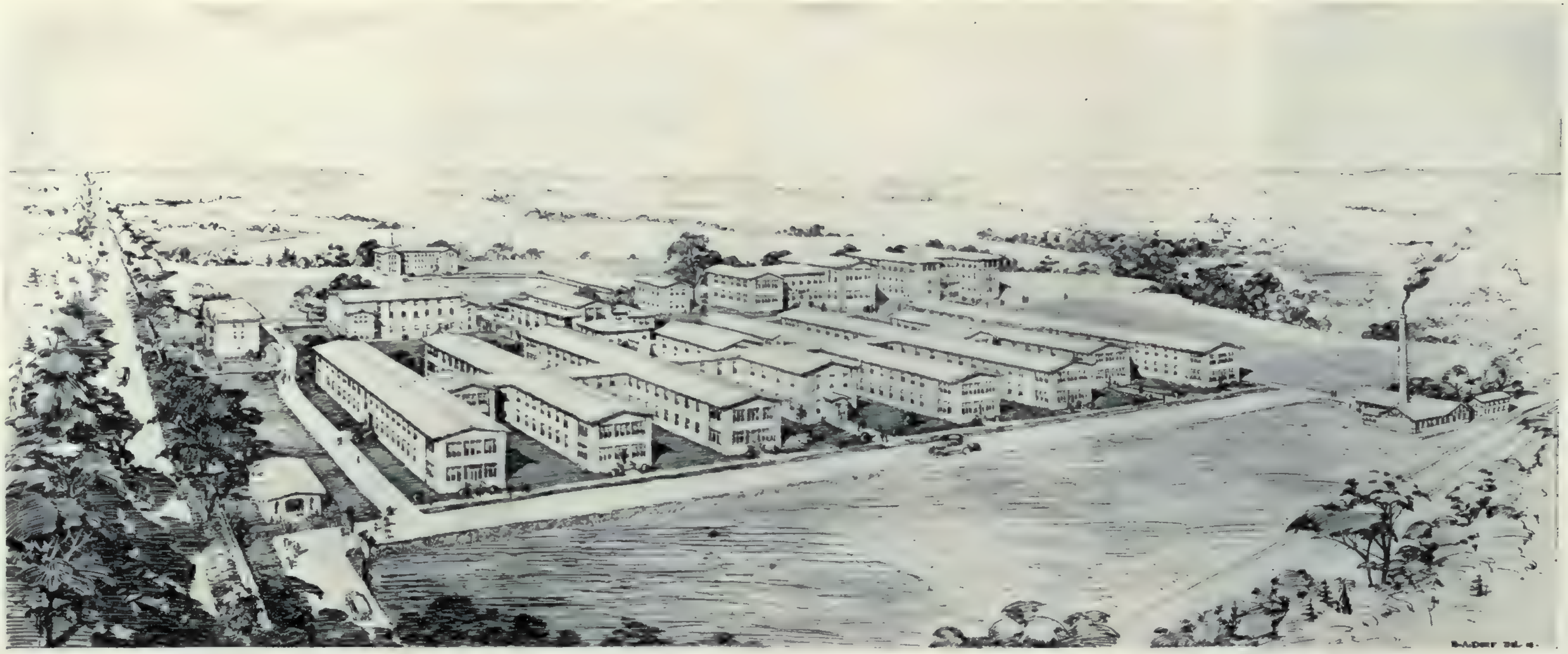
CANADA'S WAR HOSPITAL DEVELOPMENT 87
By J. H. W. Bower, B.A.Sc., General Superintendent, Engineering Branch.

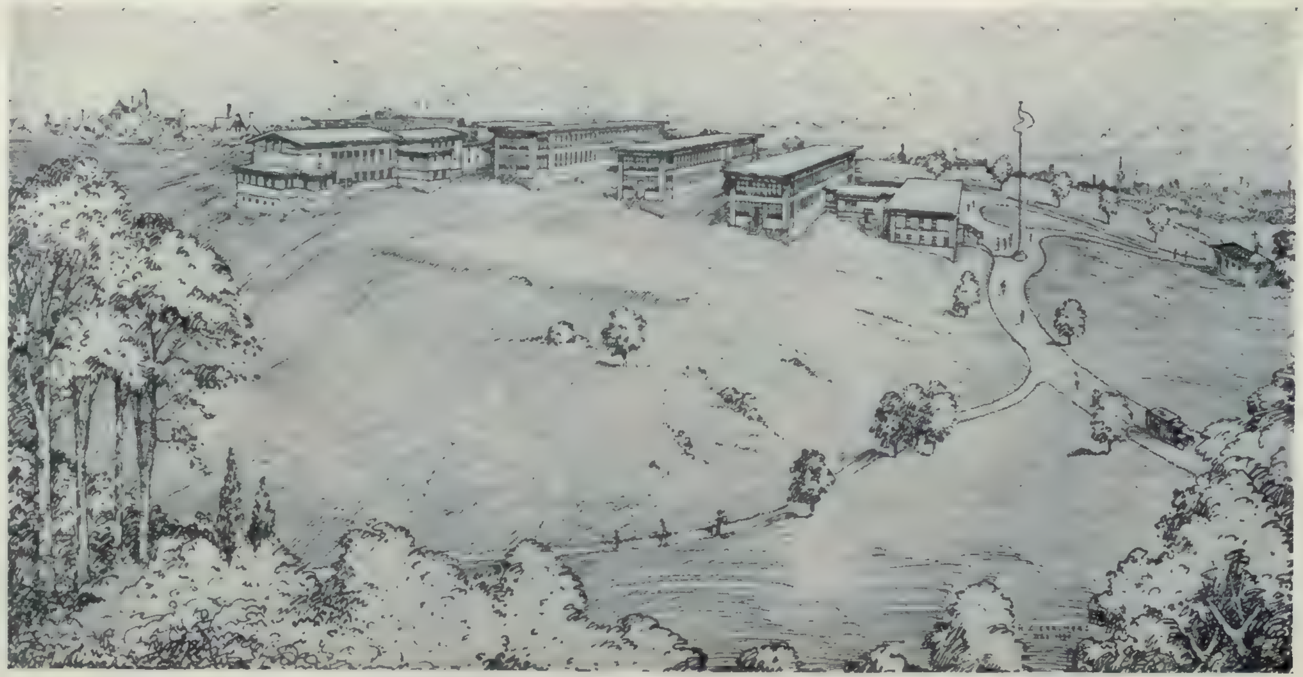
EDITORIAL 99
Canadian Materials and Imported Products.

Frontispiece

MILITARY HOSPITALS AT STE. ANNE DE BELLEVUE, P.Q., AND CAMP HILL, HALIFAX, N.S. 70

H. GAGNIER, Limited, Publishers
GRAPHIC ARTS BLDG., TORONTO, CANADA
BRANCH OFFICES
MONTREAL NEW YORK





CANADA'S
MILITARY
HOSPITALS.

DEPARTMENT OF
PUBLIC WORKS,
OTTAWA.

R. C. WRIGHT,
CHIEF ARCHITECT.

W. L. SYMONS,
ARCHITECT IN
CHARGE OF
MILITARY
HOSPITALS.

UPPER VIEW:
STE. ANNE DE
BELLEVUE, P. Q

LOWER VIEW:
CAMP HILL,
HALIFAX, N. S.

Canada's Military Hospitals

By W. L. Symons, Architect in charge of Military Hospitals.

THE question of Military Hospitals, their inception and rapid development under the administration of the Military Hospitals Commission, has been dealt with in a former number of this magazine. Too much cannot be said in praise of the original organization, in its efforts to cope with a situation so new, so sudden, and so prodigious in its scope, as the caring for the ever-increasing flow of convalescents from the battlefields of France and Flanders.

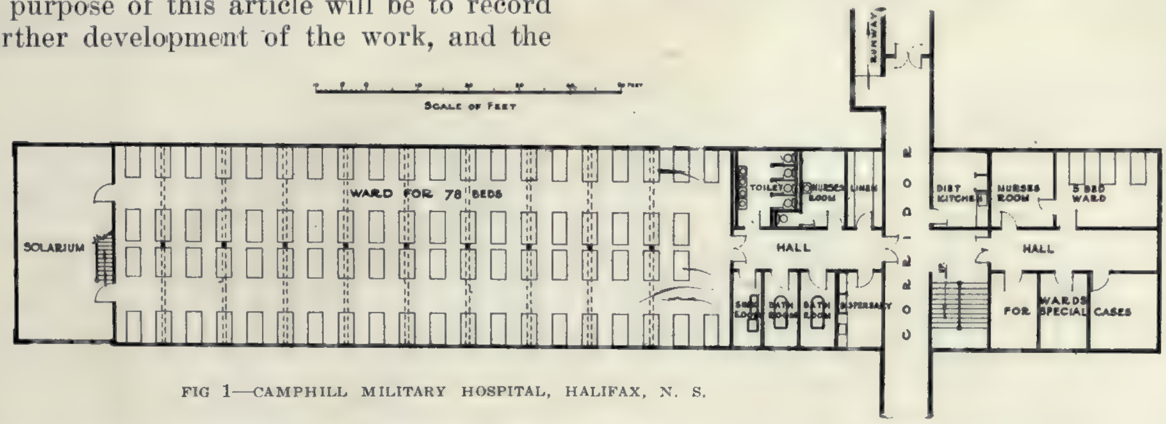


FIG 1—CAMPHILL MILITARY HOSPITAL, HALIFAX, N. S.

The purpose of this article will be to record the further development of the work, and the gradual evolution in hospital planning and growth which has brought the work to its present state of completion.

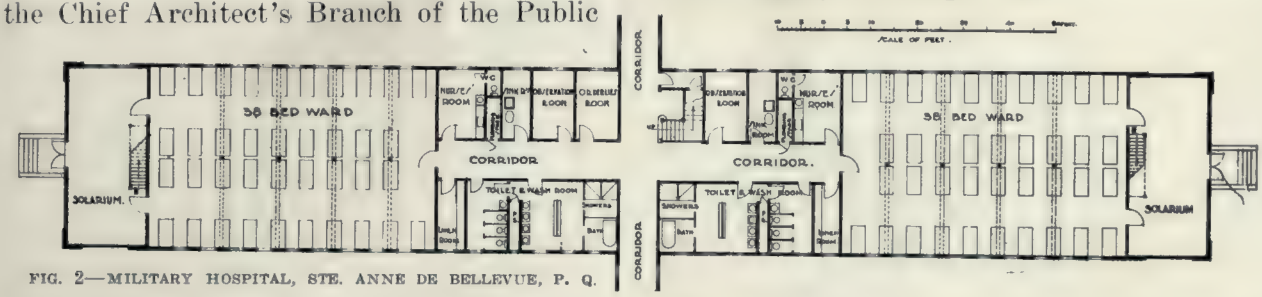


FIG. 2—MILITARY HOSPITAL, STE. ANNE DE BELLEVUE, P. Q.

On April 1st, 1918, the entire work of building and equipping military hospitals was transferred from the Military Hospitals Commission to the Chief Architect's Branch of the Public Works Department, Ottawa, and to the efforts of that staff are due the success which has attended the furtherance of this work to its present stage of development.

The Department of Militia and Defence, under whose authority the control and maintenance of all military hospitals came upon completion, appointed a special committee at the time consisting of an expert in each branch of the Medical and Surgical Service. To this Board of Consultants were referred the plans for expert advice, and to this collaboration with the architects is no doubt due a large measure of the success attained.

Beginning, as it did, in the early period of the war, with the caring for invalid cases in private houses—many of them generously loaned to the Government by the owners—the growth of military hospitals in Canada might be recorded as follows:

(a) The remodelling of large dwellings such as Oak Hill Military Hospital, St. Catharines, Ont.; Elmhurst, Kingston, Ont.; and the Sir Sandford Fleming House, Ottawa, Ont.

(b) The remodelling of schools, colleges, and other large public buildings, such as Queen's University, Kingston; Loyola College, Montreal; Knox College, Toronto; Ross Park School, Moose Jaw; Earl Grey School, Regina; Ogden Hotel, Calgary; Shaughnessy and Fairmount Schools, Vancouver, etc.

(c) By additions to existing institutions, such as the Asylum at Whitby, Ont., and the Reformatory at Guelph, Ont.

(d) By the building of entirely new units capable of expansion, as, for example, at Camphill, Halifax; Ste. Anne de Bellevue, P.Q.; Westminster, London, Ont., and Tuxedo, Winnipeg.

The latter development represents to date the ultimate and most important phase of military hospital work which has so far been carried out. As the war dragged on into the third year and the devastation and toll in lives became very real, those entrusted with the work began to realize what a tremendous undertaking confronted them. It likewise became evident that the demand for facilities was fast outgrowing the policy of altering and adding to existing buildings. New buildings with increased accommodation must be provided, and on short notice, buildings of permanent construction were out of the question. Then it was that the construction of semi-temporary buildings became the set policy. The type adopted had much to recommend it. It was economical, could be quickly built and easily altered and added to.

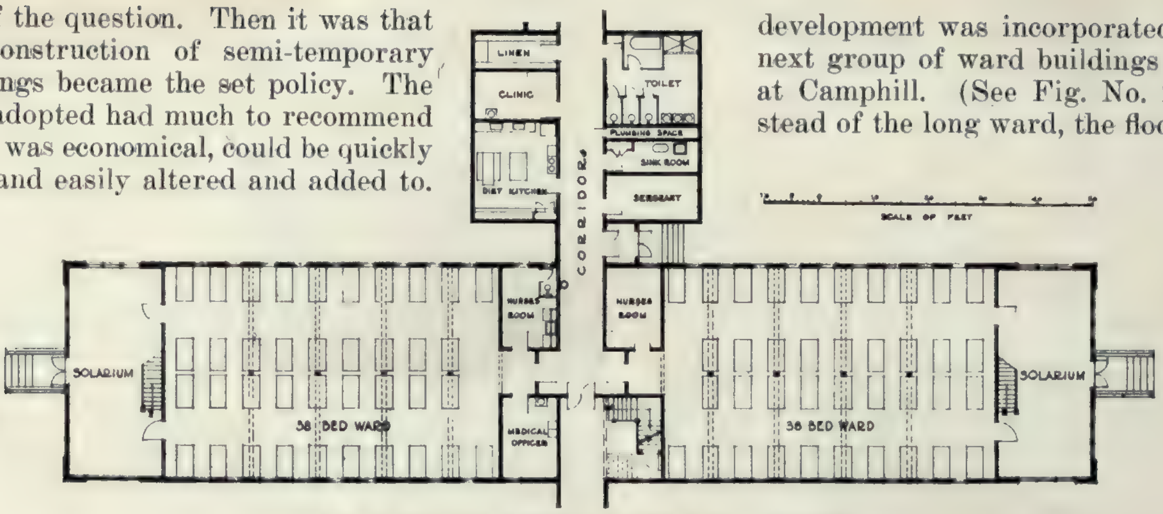


FIG. 3—MILITARY HOSPITAL, TUXEDO PARK, WINNIPEG.

The first building of this type and an entire unit was built at Camphill, Halifax, N.S. (See Fig. No. 1) It consisted of two ward buildings, each accommodating one hundred and fifty patients, together with a general service building.

These ward buildings were two storeys high, providing on each floor for one large ward of 76 beds. At one end of the ward was a connecting corridor, and adjacent to it were rooms for nurses, orderlies, toilets, and general utilities. At the other end was a large solarium with a stairway leading from the first to the second floor.

This arrangement of stairs was most workable, as it served to reduce the traffic through the wards, and at the same time would afford quick and easy exit in case of fire. The solarium was invariably made a most attractive lounge room, thanks to the efforts of the ladies of the local societies. As a description of this first type of unit was given in a former article it is unnecessary to go further into detail here. Suffice to say that as a first attempt it proved eminently satisfactory, so much so that duplicates were built at North Toronto and Winnipeg.

Further study of the problem, however, suggested improvements which subsequently led to certain changes in the ward unit plan. The first development was incorporated in the next group of ward buildings erected at Camphill. (See Fig. No. 2.) Instead of the long ward, the floor space was divided into two self-contained wards of 37 beds each, with its full complement of nurses' and utility rooms, while the connecting corridor, instead of being at one end, was made to connect the units midway in their length. The advantages were manifest. The smaller number of patients in a ward made for better discipline and efficiency generally. This second plan was followed in some of the new wards at Cobourg and Ste. Anne de Bellevue. While very compact and workable, even this plan was found to be capable of improvement, and a third development was worked out. This last change made for economy, but it is still an open question whether it did not possess disadvantages sufficient to outweigh this feature. (See Fig. No. 3.) In this plan the nurses' and orderlies' rooms were left adjoining the ward, but all toilet and utility rooms were placed in a small separate building, a sort of enlargement of the through corridor. The chief improvement was in the farther removal from the wards of the odors from diet kitchen, toilets, etc., but to offset this was the disadvantage of the distance the meals and other bed services had to be carried.

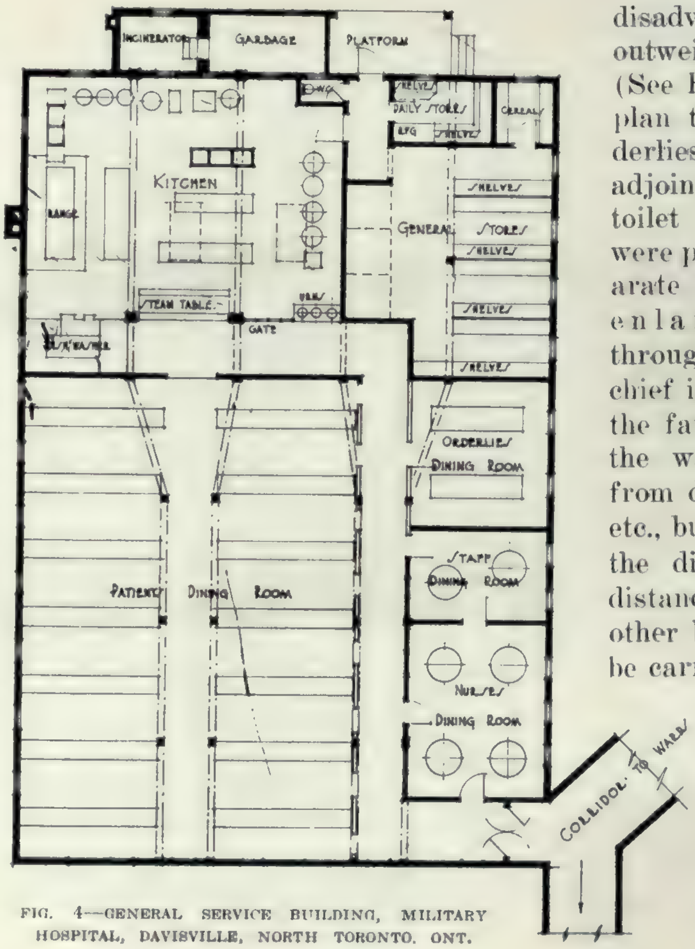


FIG. 4—GENERAL SERVICE BUILDING, MILITARY HOSPITAL, DAVISVILLE, NORTH TORONTO, ONT.

GENERAL SERVICE BUILDINGS.

One important feature of all the larger groups was the general service building, containing the kitchens with all accessory rooms, and dining-rooms. These buildings represented much study, and passed through several stages of development with each successive step making for a more workable and better systematized plan. The first was erected at the Davisville Hospital in North Toronto (See Fig. No. 4) and consisted of a large kitchen containing the necessary equipment for preparing and cooking the food, and washing and sterilizing the dishes. The only additional rooms were for cold storage and garbage disposal. The main dining-room had a seating capacity equal to two-thirds of the total number of patients, and adjoining were separate dining-rooms for nurses, orderlies, medical officers, etc.

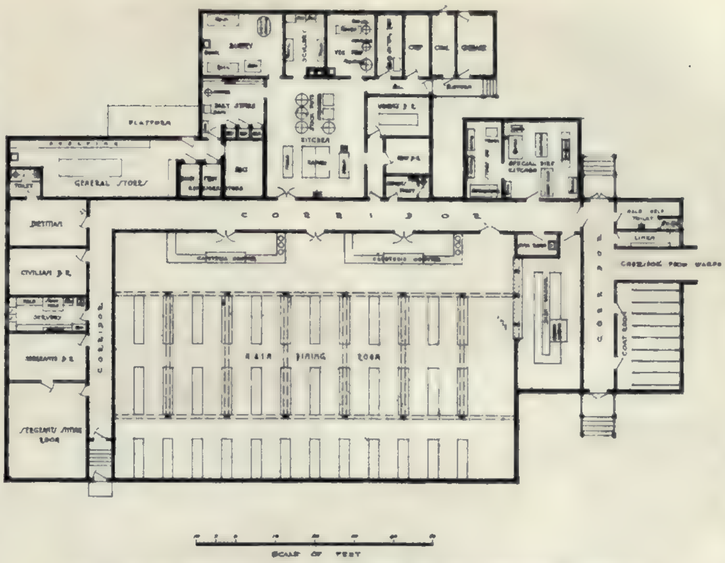


FIG. 5—GENERAL SERVICE BUILDING, CONVALESCENT HOSPITAL, STE. ANNE DE BELLEVUE, P. Q.

At Fredericton and Ste. Anne de Bellevue this scheme was enlarged. (See Figs. No. 5 and 6.) The main kitchen contained only the ranges and other cooking equipment, while the food preparation, the bakery, dishwashing, refrigeration, general stores, and garbage disposal had each a separate room opening off the main kitchen. As may be seen on the detailed plans, the main kitchen is lighted with clerestorey windows which provide excellent light as well as ventilation. The working equipment is of standard hotel heavy duty type, consisting of ranges, steam cookers, steam-heated stock pots, steam tables, motor-driven vegetable peelers and food choppers, and for centers where the population exceeded 250, motor-driven dishwashing machines were installed.

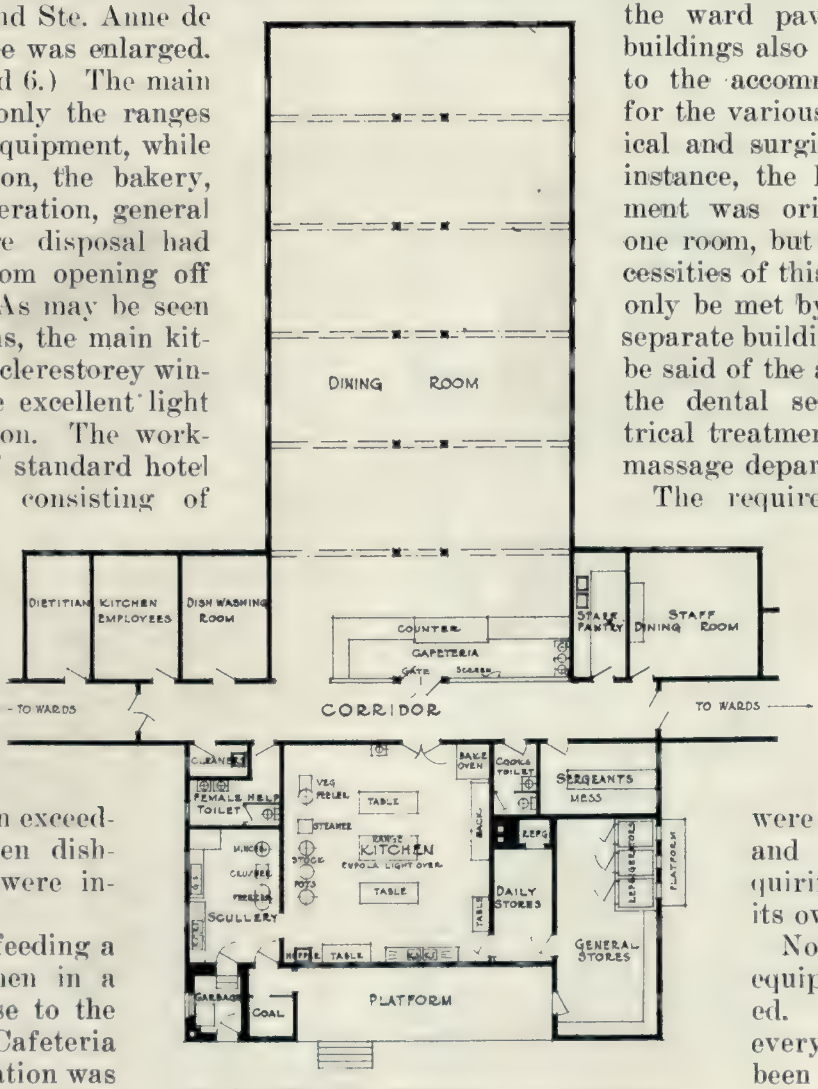


FIG. 6—MESS UNIT, FREDERICTON (N.B.) HOSPITAL.

The necessity of feeding a large number of men in a short time gave rise to the introduction of a Cafeteria service. This innovation was first introduced at the Discharge Depots at Halifax and Quebec where all convalescents were cleared from inbound ships, as many as fifteen hundred patients being served at a single meal. The system worked so successfully here that it was thoughts wise to install it in some of the larger hospitals, such as Ste. Anne de Bellevue, where as many as seven hundred patients were often served.

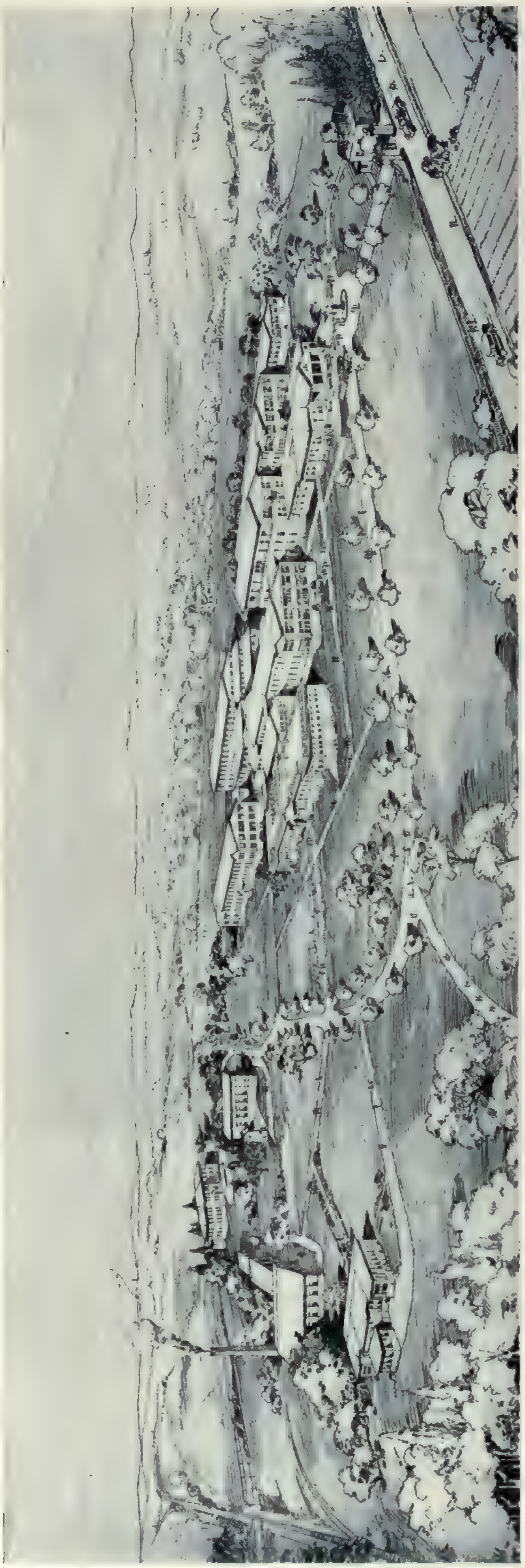
At the larger centers refrigerating plants have been installed for cooling purposes and for the production of artificial ice. Also fully equipped steam laundries were provided, including steam sterilizers for bedding and clothing.

MEDICAL AND SURGICAL DEPARTMENTS.

The development outlined in the planning of the ward pavilions and service buildings also occurred in regard to the accommodation required for the various branches of medical and surgical work. As for instance, the laboratory department was originally housed in one room, but eventually the necessities of this department could only be met by the erection of a separate building. The same may be said of the accommodation for the dental service, X-ray, electrical treatment department and massage department.

The requirements consequent on research in these departments were developed so rapidly and were of such importance that in each case special rooms and equipment were found necessary, and subsequently requiring a building for its own use.

Nor has the scientific equipment been neglected. On the contrary every department has been planned and outfitted along the most scientific lines known to the medical profession.



PSYCHOPATHIC HOSPITAL, LONDON, ONT.

The surgical buildings contain, in addition to most up-to-date operating rooms, all the complementary rooms, such as preparation, sterilizing, X-ray, etc. There are also the necessary provision for the treatment of nose, ear and throat cases, and up-to-date dental suites. One of the most interesting features is the hydrotherapy department with its full complement of electrical, continuous hot and cold water and arm and leg baths. These rooms are immaculate in white tile, marble, and white enamel paint, and the equipment is the best that science has produced.

While endeavoring to evolve the best methods for restoring the health of the patient through modern equipment and efficient service, the thought was ever uppermost in the minds of all concerned as to their future welfare. This instituted what is known as the Vocational Branch under whose supervision was the work of industrial re-training and occupational therapy. This endeavored to reach beyond the physical aid and presented a two-fold value in that it aided recovery as well as equipping the patient for useful service after leaving the hospital.

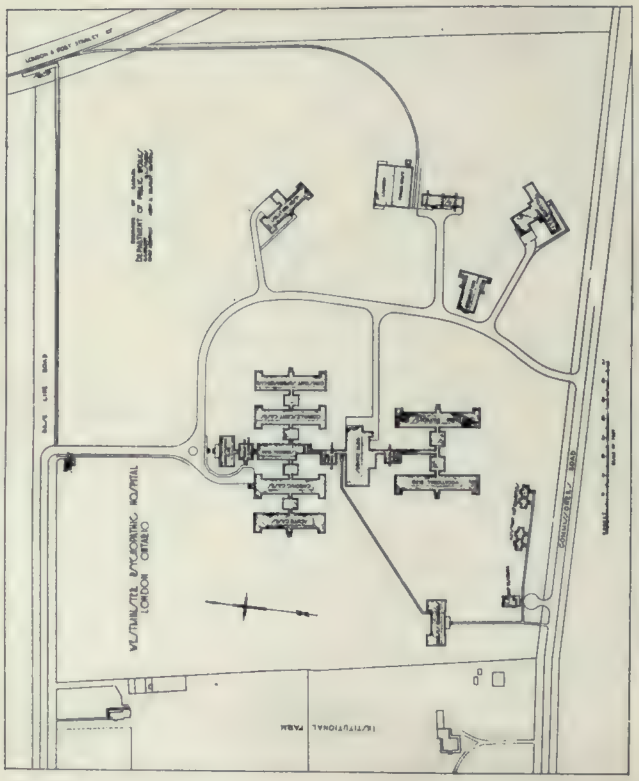


FIG. 7—BLOCK PLAN, PSYCHOPATHIC HOSPITAL, LONDON, ONT.

Not the least interesting phase of the designing of these hospitals has been the grouping of the buildings. Every site, of course, presented its own problems, and the study given to the Block plan has contributed in no small degree to the successful working out of the schemes.

From the illustrations (See Figs. 7, 8, 11, 12 and 13) it will be noted that no two are alike, or even similar, while they all embody the same general requirements.

There is the main approach, with in most cases the Guard House. Then the Administration building around which the others are grouped, and in which accommodation is provided for the Officer Commanding and his staff, the matron, bursar, etc.; the Service building containing the kitchen and dining-rooms, and the required number of ward buildings. The several units of this main group are all connected by corridors or covered ways, and then around this, conveniently placed on the site, are the homes for nurses, orderlies, medical officers, and at the larger centers a recreation building and vocational training building.

DINING ROOM, STE. ANNE DE BELLEVUE, P. Q.

As the reader can readily realize, one big problem in our rigorous climate was that of heating, and the manner in which that problem has been overcome is one of the noteworthy fea-

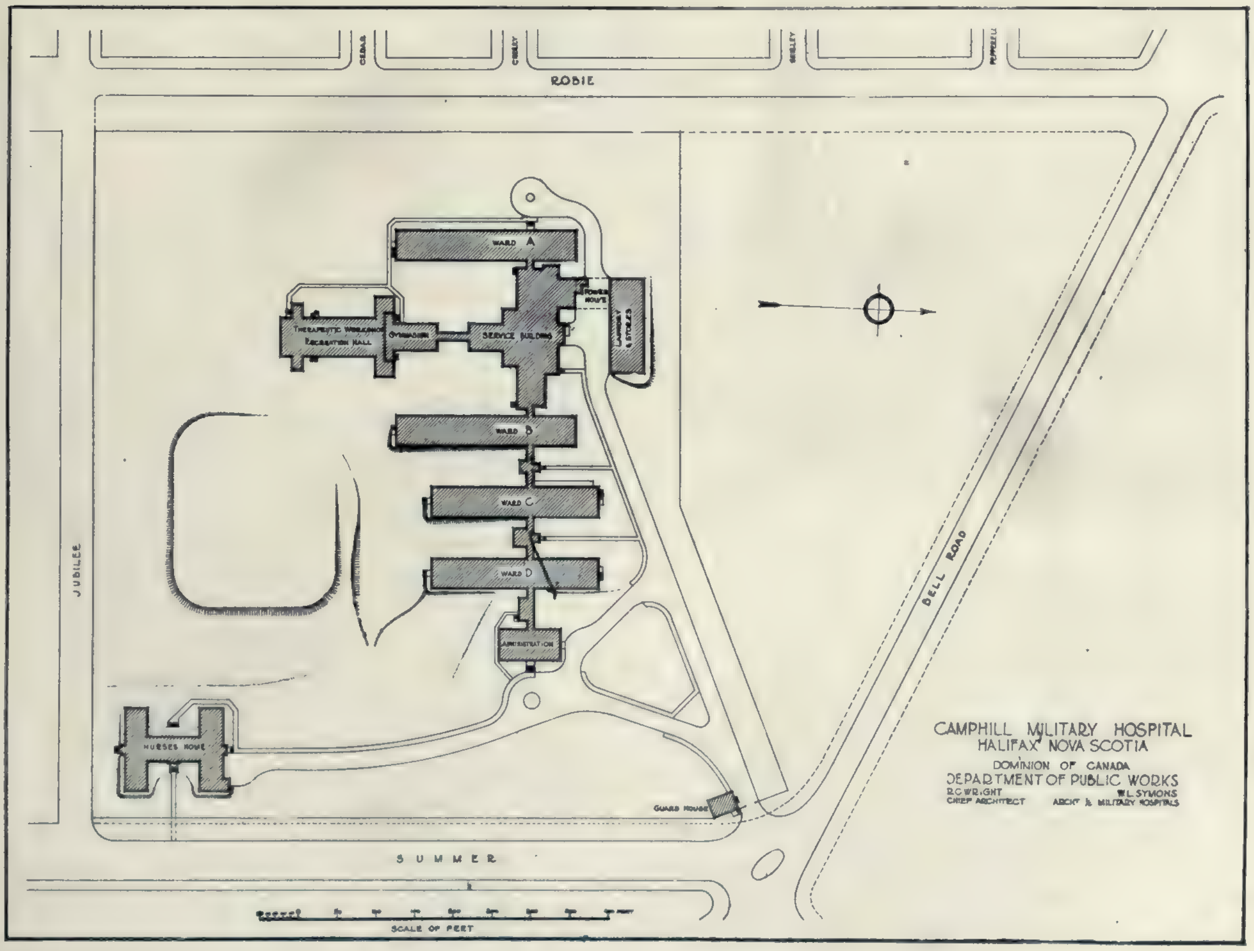


FIG. 8—BLOCK PLAN, CAMPHILL MILITARY HOSPITAL, HALIFAX, N.S.

tures of these institutions. The buildings are all heated by steam supplied through tunnels from a central heating and power plant.

To solve the fuel supply question an effort was always made to locate on or close to a railway siding. The most unique case is at Ste. Anne de Bellevue where the tracks are laid right over the coal bunkers. Then, too, there were other engineering problems. If the hospital was located within, or adjacent to a municipality having all the public utilities, the question of water, light, sewage disposal, etc., were simple; otherwise systems had to be installed in connection with the central heating plant.

The esthetic has not been overlooked in the attempt to secure the best results, and the most possible has been made of the simple materials used. The color scheme in general use is as follows: In the wards the main walls are a light buff, with dado a deep buff and ceilings cream. In the utility rooms the woodwork is finished in dead white enamel, while the nurses' rooms are treated with various shades of sage green, light delf blues, etc. The kitchens and service rooms

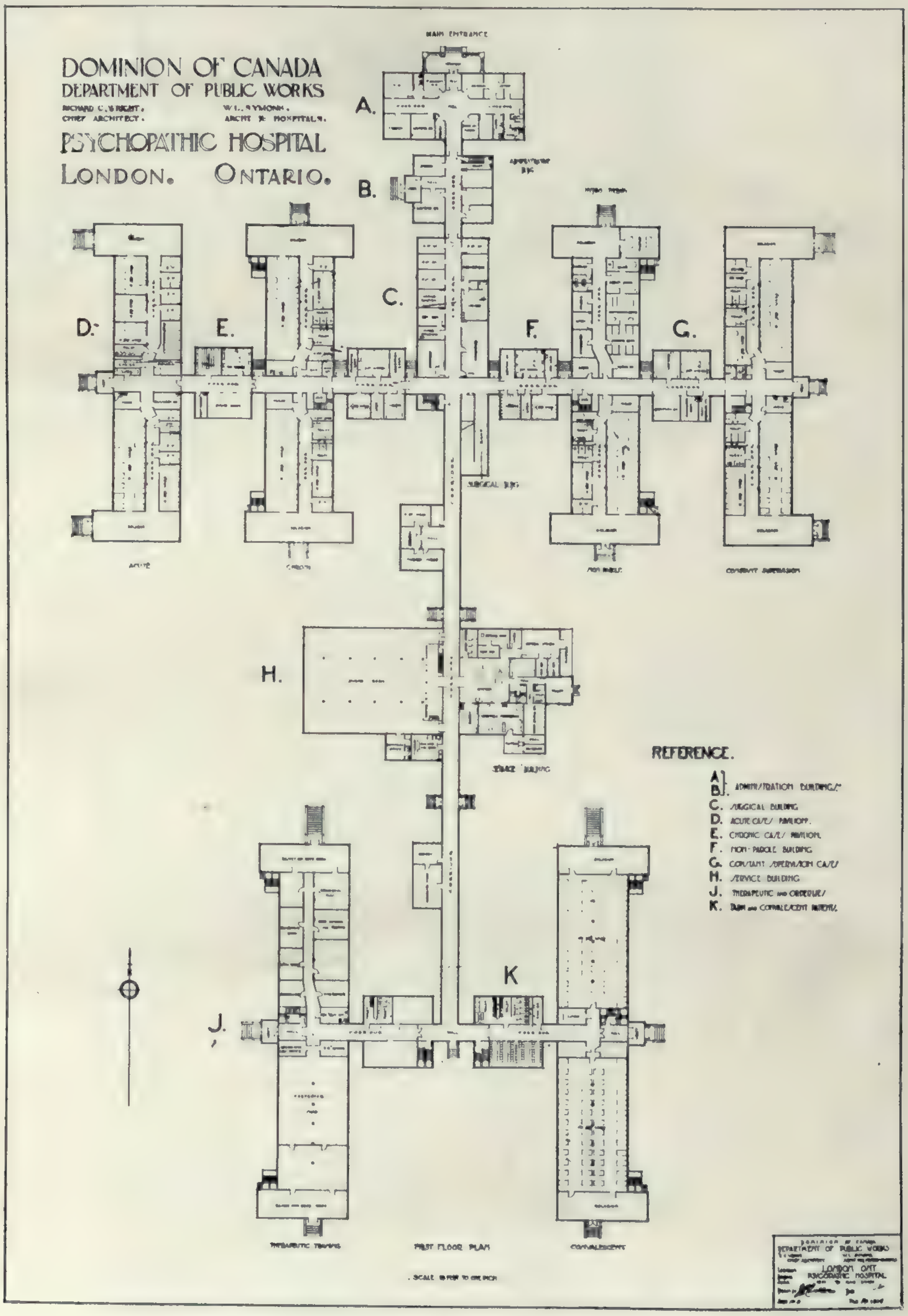


FIG. 9—FIRST FLOOR PLAN, PSYCHOPATHIC HOSPITAL, LONDON, ONT.

are finished in flat cream white, and dining-rooms generally in tones of sage green and brown.

The buildings erected at London for psychiatric work deserve a passing note. As this institution was to be permanent, a greater efficiency in planning was aimed at, and the plans evolved were made in consultation with experts in that particular work.

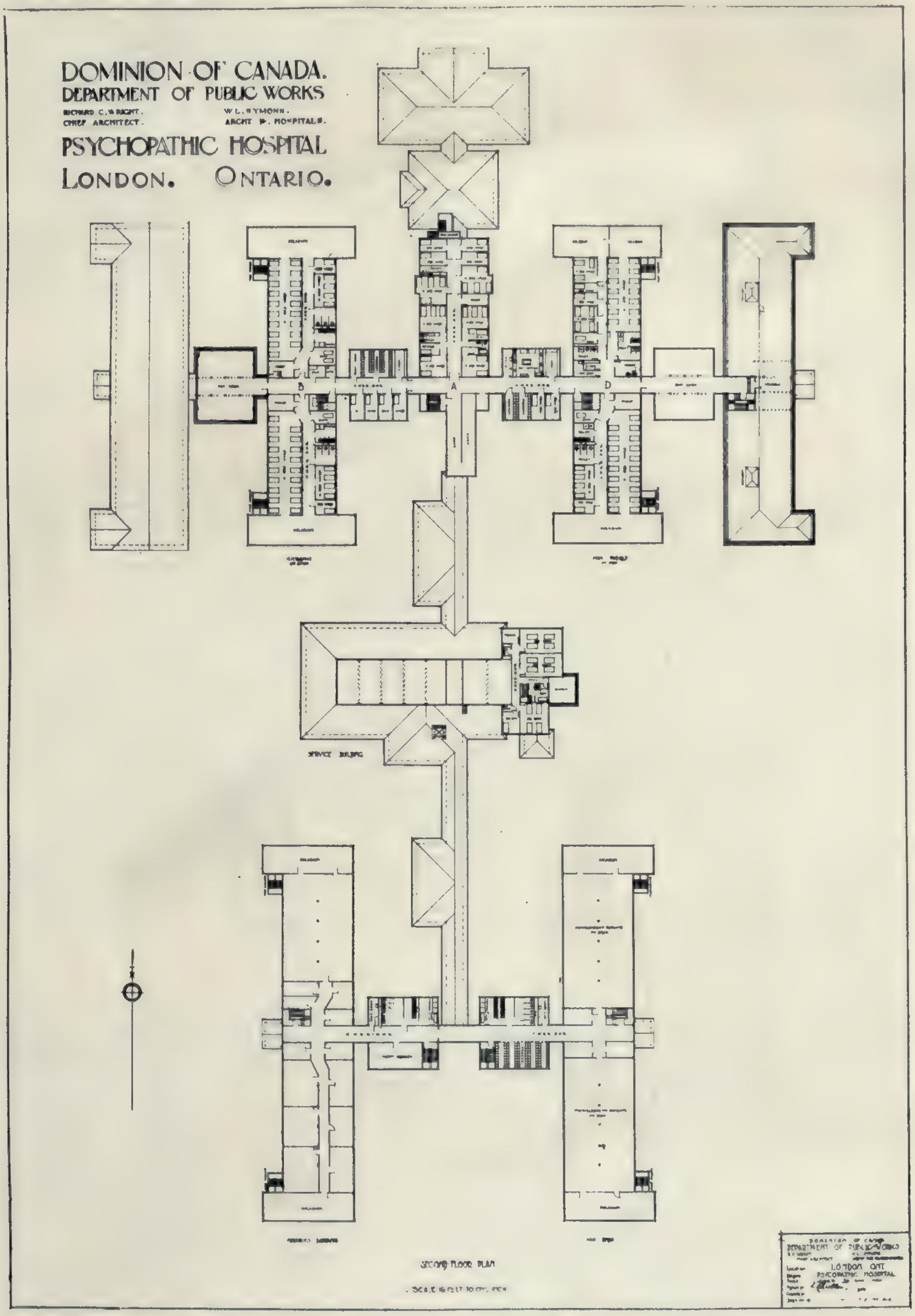
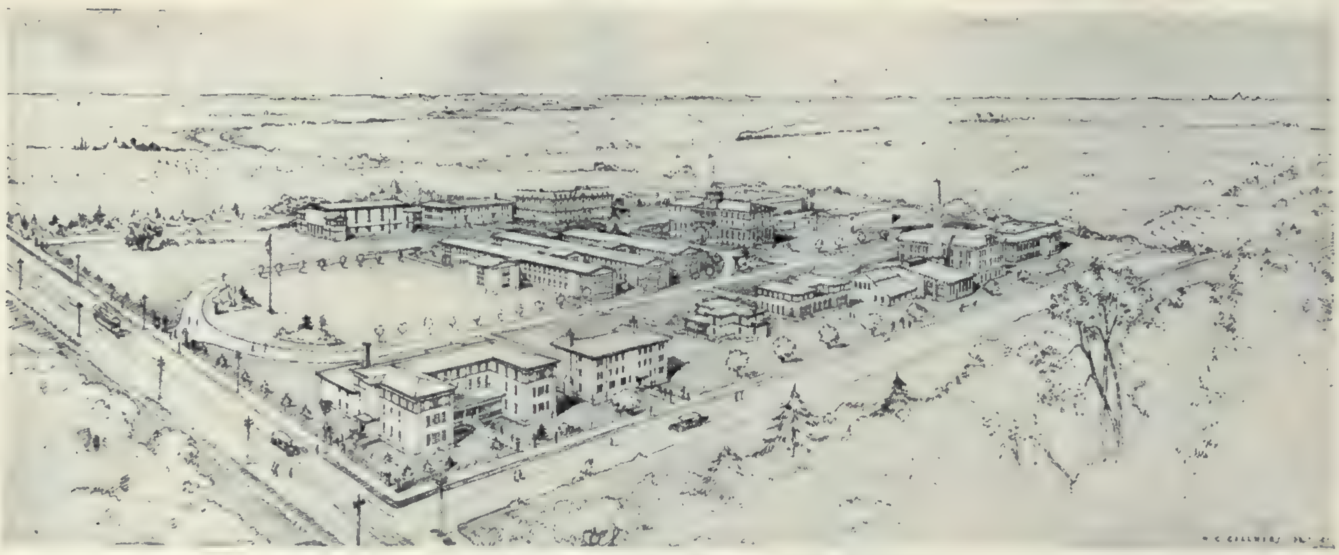


FIG. 10—SECOND FLOOR PLAN, PSYCHOPATHIC HOSPITAL, LONDON, ONT.

The Dominion Orthopaedic Hospital in Toronto is also regarded as a permanent institution. The orthopaedic cases not only receive treatment whether surgical, electric or massage, but all appliances requisite for each separate case are made here. In planning the main hospital building the architects were in constant advice with experts in orthopaedic work; the plan thus evolved will prove of interest to those specializing in orthopaedic cases.

Besides the special accommodation for psychiatric work at London, and the orthopaedic work at the Hospital in Toronto, accommodation was also provided at Ste. Anne de Bellevue for oral and facial cases.



TUXEDO PARK MILITARY HOSPITAL, WINNIPEG, MANITOBA.

The buildings required for the care of the tuberculosis patients call for a separate article, but it may be mentioned in passing that accommodation for 750 patients was erected by this department exclusive of the additional buildings erected in conncetion with the Provincial sanatoria.

It is indeed gratifying to know that the design of the military hospitals has been so thoroughly worked out as to command the attention of other countries. Especially is it pleasing when one realizes that this large problem had to be solved in the western hemisphere without any precedent. Our friends to the south have more than once expressed their appreciation of Canada's work in this direction and frankly admit the value accruing to them from her painstaking efforts. This is due wholly to our early advent into the war which furnished the opportunity of demonstrating our ability to grasp a problem of such magnitude in a broad and wholesome manner.

The task demanded speed and thoroughness. It was not sufficient, in itself, to provide merely a shelter—the relation of the patient, food and treatment had to be considered with the fewest possible intervening motions. The site with its environment, its accessibility to friends and visiting physicians; its remoteness from disturbing influences; its privacy, was another potent factor. The impression conveyed by the appearance of the buildings as well as their general relation to each other was only another of the essential considerations. These, with many others made the matter in hand a stupendous undertaking and brings just credit to the Canadian people through the successful efforts of those upon whom this burden fell.

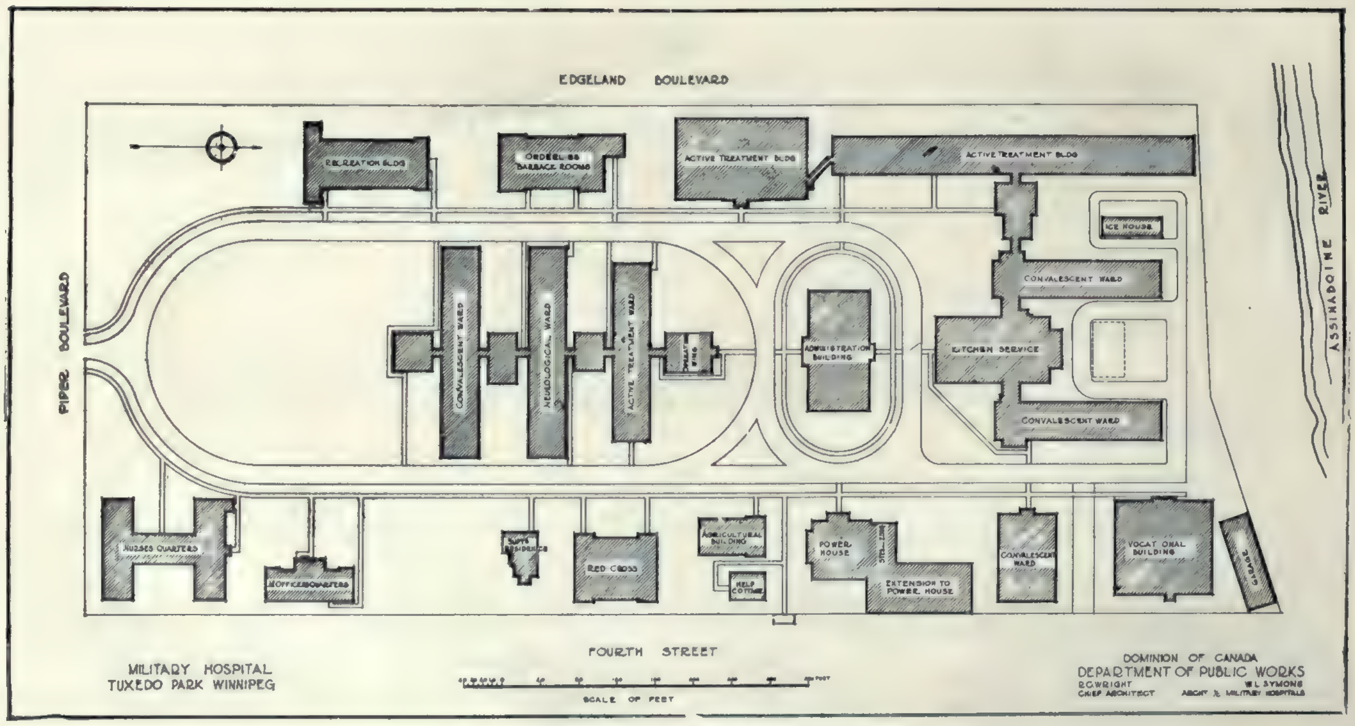


FIG. 11—BLOCK PLAN, TUXEDO PARK HOSPITAL.

In other words, the military hospital work in Canada was a problem of its own, and very little assistance in its development could be obtained by studying the buildings in France or England, and the Americans were too late in the war to be of any service in this respect. They developed a one-storey hospital scheme when later it was realized that two-storey buildings were more adaptable on account of administration, maintenance and cost of erection, while in Canada the first pavilions erected were two storeys, and this scheme was carried out through the entire war time, the original plans only being altered from time to time as new requirements arose.

COST PER PATIENT'S BED.

The cost of the buildings per patient's bed in the hospitals was approximately $1,650, in this cost being included the pro rata portion of all buildings on the Campus, and all utilities such as heat, light and water service, and also grading, road making and fencing. The cost of the hospital at London, on account of being of more permanent construction was about $2,500 per bed.

In regard to the cubic contents of the wards per bed, an average of 650 cubic feet per patient at least was maintained at all centres, and a window surface of 25 per cent. of the total wall space in each ward.

Some idea of the extent of the programme of military hospitals work may be obtained when it is realized that about $15,000,000 has been spent by the Government in this work, the bulk of the buildings being erected and equipped in the short space of 18 months time, and that this work was carried on in over eighty different hospital centres in cities and towns throughout the Dominion.

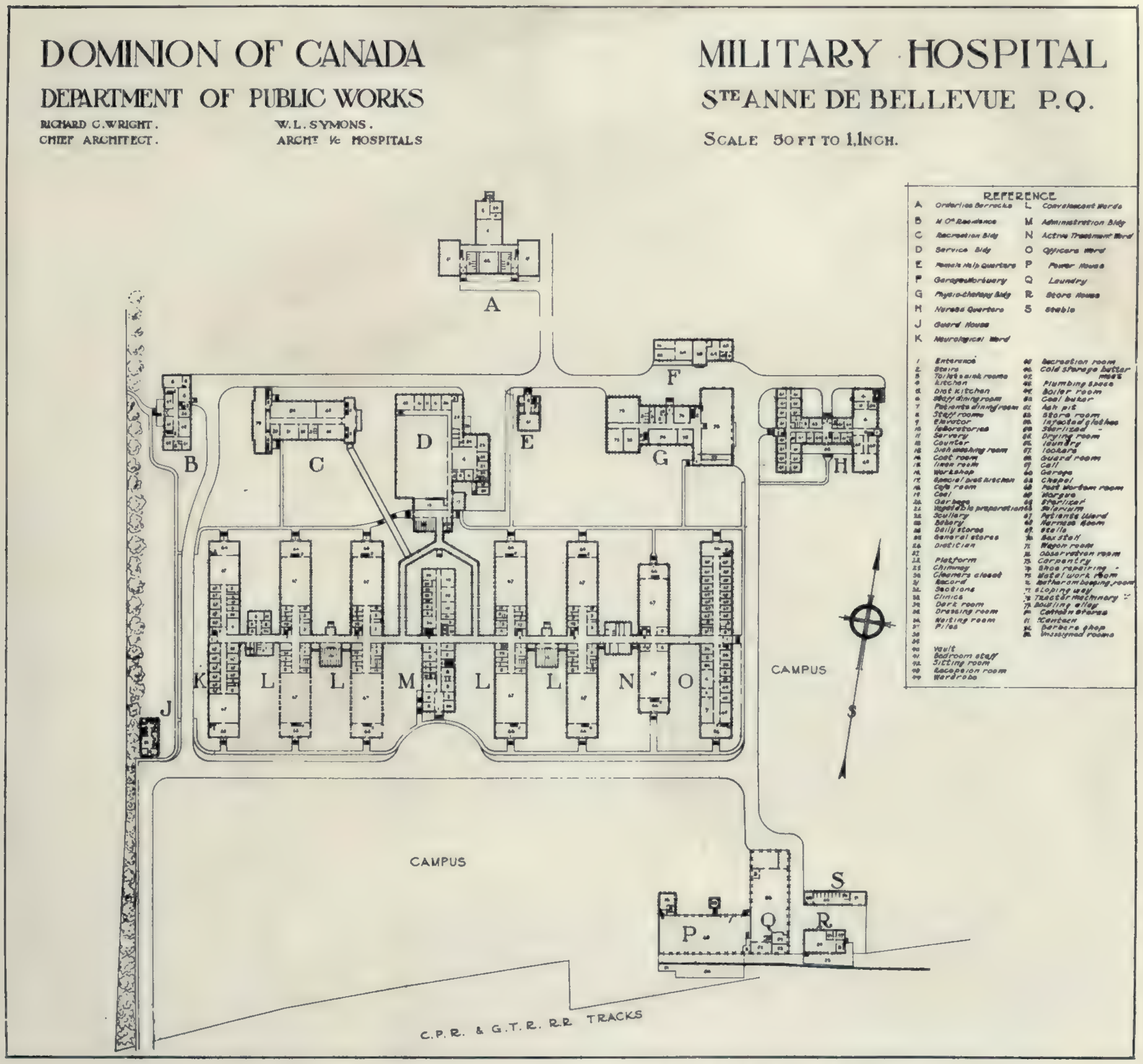
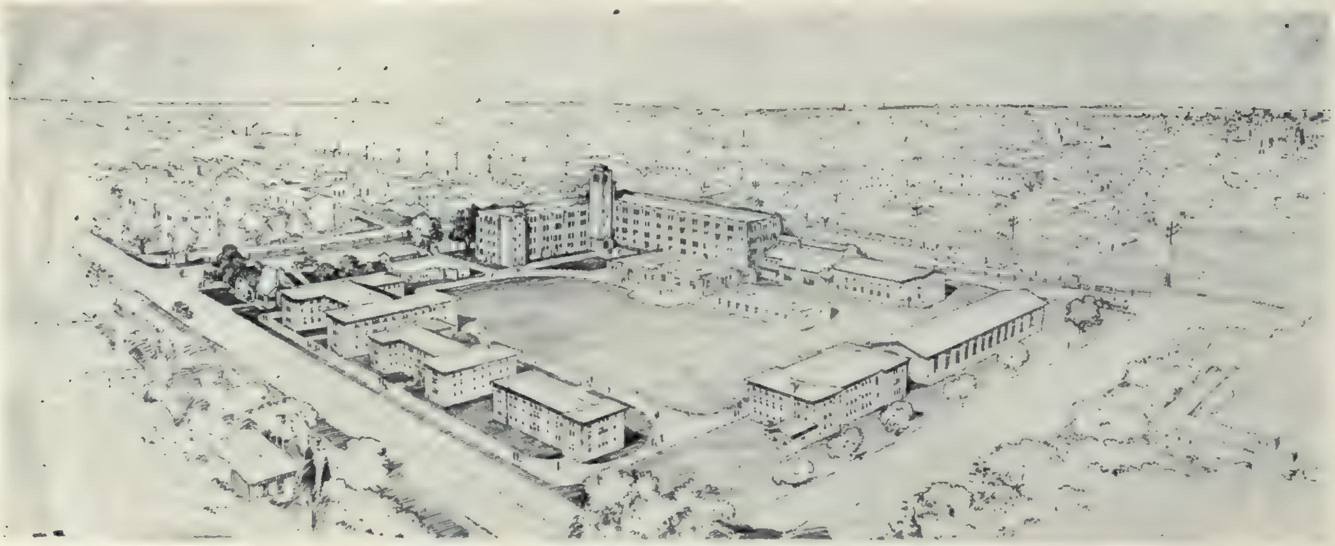


FIG. 12—GENERAL PLAN OF MILITARY HOSPITAL, STE. ANNE DE BELLEVUE, P. Q.



TORONTO ORTHOPAEDIC MILITARY HOSPITAL.

SUMMARY.

Considering the magnitude of the project and the manifold and varied problems entering into it, the erections of war time hospitals, especially in connection with the planning of the various departments, presents certain experiences which should have an important bearing on future hospital design in general. One of the most outstanding of these was constant changes in plan necessitated by the wonderful strides made during the war in all branches of hospital work itself. This was very noticeable in the X-ray and electrical treatment departments, and also

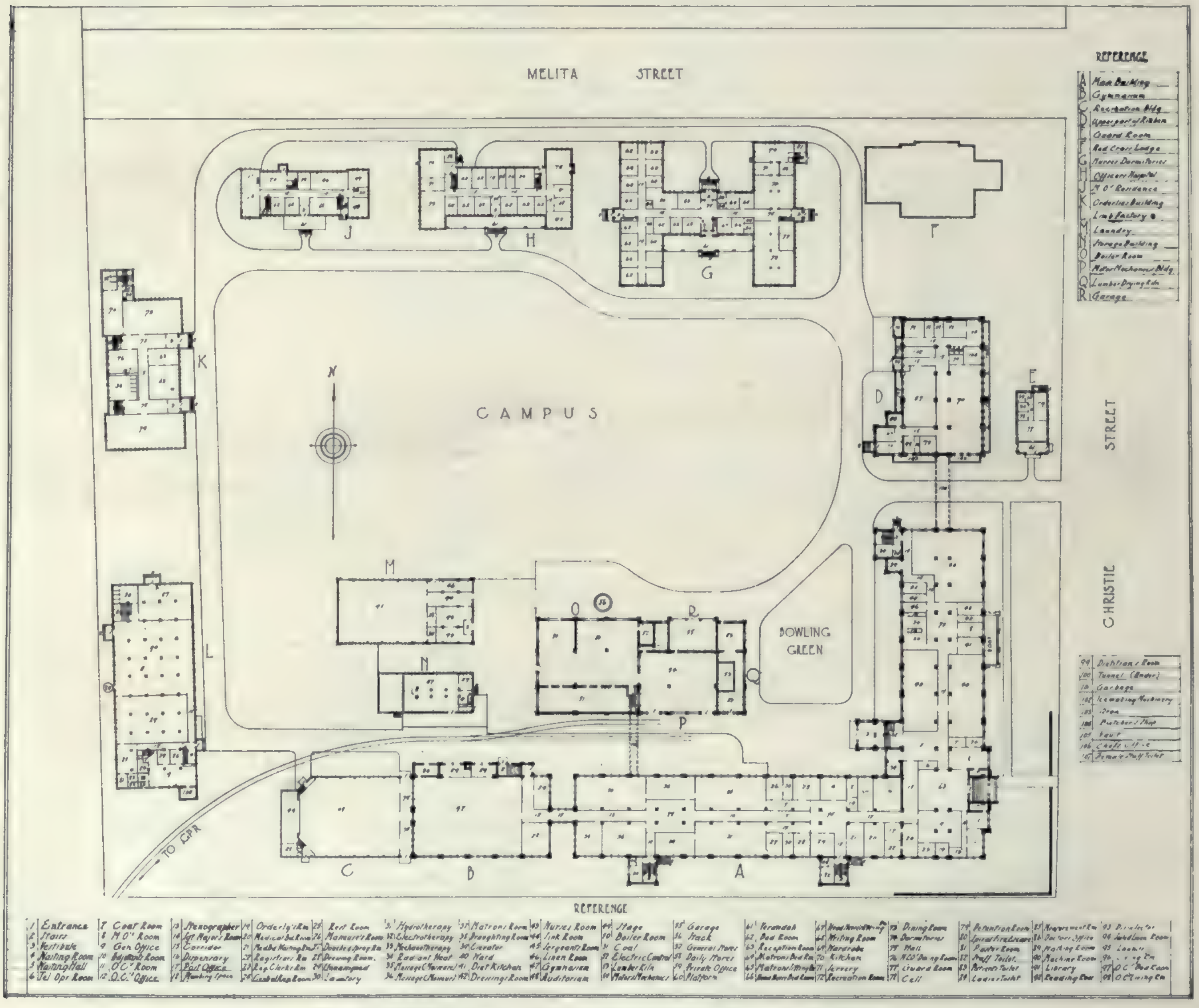


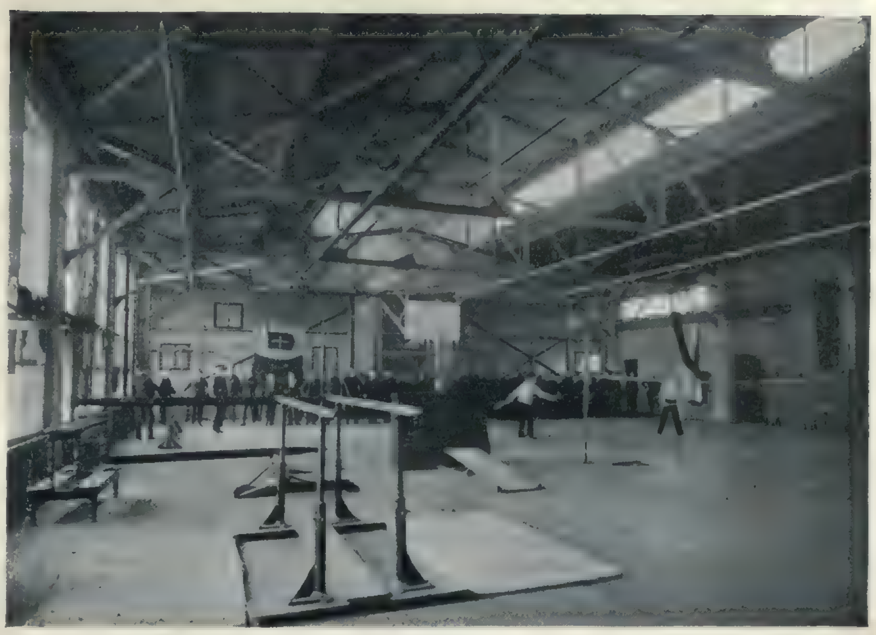
FIG. 13—GENERAL PLAN, TORONTO ORTHOPAEDIC MILITARY HOSPITAL.

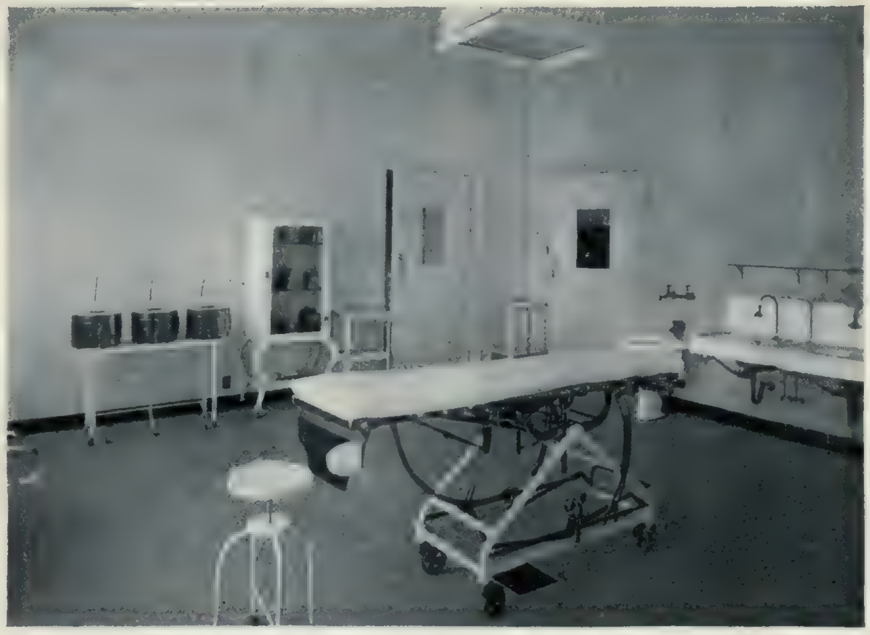
the hydrotherapy and massage departments and equally noticeable in the application of the work of these branches to psychiatric work, and in a lesser extent to that for tuberculosis treatment.

The development in providing for the housing and treatment of infectious diseases should prove of interest and value, and also that for the venereal hospitals which were almost unknown before this time, and consequently may be termed a war product.

The application of vocational training to mental and tubercular patients has necessitated considerable space being set apart for this important work, in some cases separate buildings being erected, while the provision of special gymnasia in connection with orthopaedic hospitals has opened up an entirely new study.

The question arises as to how far it is desirable to erect expensive buildings such as five and six-storey fireproof structures, in view of the fact that the requirements in the various departments are far from being standardized. Even the question of ward planning is still a much discussed one among medical men. Some leading doctors quite firmly maintain that the erection of two or three-storey buildings of slow burning construction is to be recommended, so planned as to be easily and quickly altered to suit important changes which are subsequently found to be necessary and desirable. In fact it is now quite fully realized that the plan and equipment of mental and tubercular sanitariums erected even as recently as ten years ago, and carefully planned at the time, fail in a large measure to meet present hospital requirements, and on account of the initial cost of the original structures, which in most cases still bears heavily against them, the administrators of these buildings find it both difficult and costly to carry out alterations desired by the medical advisers.


GYMNASIUM, TORONTO ORTHOPAEDIC MILITARY HOSPITAL.


OPERATING ROOM, TORONTO ORTHOPAEDIC MILITARY HOSPITAL.

RECREATION HALL, TORONTO ORTHOPAEDIC MILITARY HOSPITAL.

X-RAY OPERATING ROOM, TORONTO ORTHOPAEDIC MILITARY HOSPITAL.

MASSAGE DEPARTMENT.

ARM AND LEG BATH AND CONTINUOUS BATHS, HYDROTHERAPY DEPARTMENT.

Consequently in the interests of economy and effective administration it would seem that the lesson to be learned from the erection of military hospitals in Canada is the suitability of two-storey and basement buildings for hospital work of all kinds. The low cost of $1,650 per bed for heavy wooden construction and $2,300 per bed for slow burning construction (this is war-time cost), combined with the ease and cost of administration if the buildings are properly placed in relation to each other, and the apparent low fire hazard as indicated by the fact that no loss of life or property damage from fire has been sustained during the time these hospital units have been in operation, all constitute arguments that favor large acreage for hospital sites and two or three-storey buildings.

Besides this there is another reason why these buildings should have considerable effect on future civic hospital planning and equipment, and that is the fact that they were erected, equipped and maintained out of Government monies and were thus not dependent upon civic or personal donations. Advantage was therefore taken of this fact, especially as regards equipment, to have the best that scientific research could devise or provide for the aid and recovery of the large number of patients receiving treatment. New standards have consequently been created both as regards planning and equipping which are at least revolutionary, and which will undoubtedly greatly influence all future work along these lines.

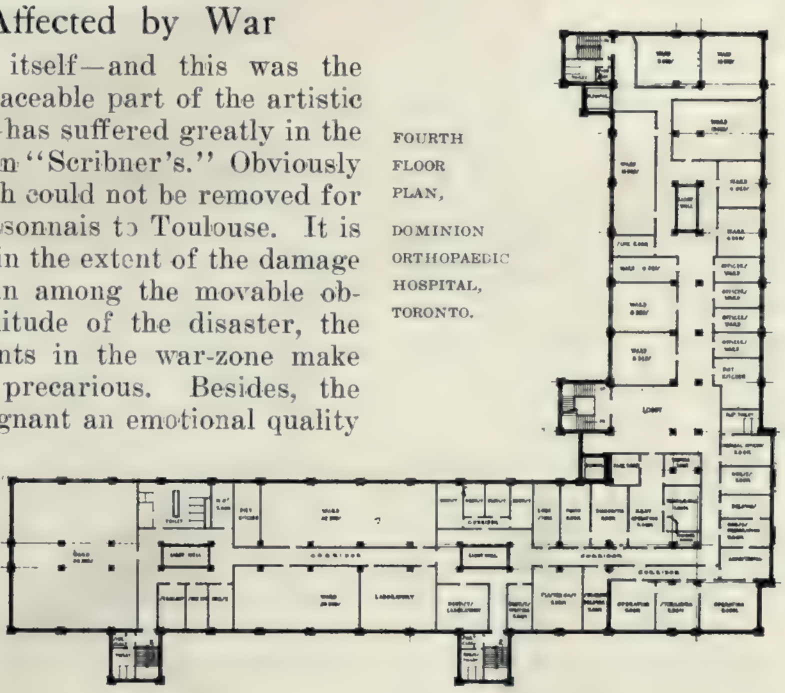
Very little loss, if any, will ensue in Canada chargeable against the expenditure of fifteen million dollars for military hospitals, as most of the buildings have been erected on permanent foundations and in such a manner as to admit of the future exterior facing of stone or brick to the upper storeys. Some hospital centers will be turned into military hospitals and barracks for the Permanent Force, others will be taken over for special work, such as mental hospitals for women and children, and altogether their planning, construction and equipment will demand that they be utilized for some good service.

In other words Canadian citizens have every reason to be grateful to find that after the "smoke of battle" they have such an unimpaired asset, in that these buildings besides fulfilling the needs of the purpose for which they were erected, have been so carried out as to enable them to successfully serve a more general use which in every way renders them of permanent value.

French Architectural Treasures Seriously Affected by War

The architecture itself—and this was the most precious irreplaceable part of the artistic heritage of France—has suffered greatly in the war, states a writer in "Scribner's." Obviously a Romanesque church could not be removed for safety from the Soissonnais to Toulouse. It is far easier to ascertain the extent of the damage among churches than among the movable objects, but the magnitude of the disaster, the number of monuments in the war-zone make precise statements precarious. Besides, the ruins possess so poignant an emotional quality that there is an almost unavoidable tendency to exaggeration. I was told the other day on excellent authority that the Germans had prepared mines to blow up the Abbey of Ourscamp, and found the holes in question, which, however, had been drilled over a century ago to receive the choir-rail. Such false reports are unfortunate, since they tend to discredit the authentic instances of atrocities that indubitably exist. I have seen with my own eyes proof that the Germans, at the time of their retreat, did deliberately blow up the churches of Boult-sur-Suippe, Heutregeville, and Betheniville, all of artistic importance.

The zones of destruction are singularly uneven. In general it is in the country churches, rather than in the great cathedrals, that the loss has been heaviest. It is clear that, with the exception of the cathedral of Rheims, comparatively little irreparable harm was done in 1914. It is along the lines held for a long period between 1914 and 1918 that the damage is most appalling. The bombardment seems to have increased in intensity as the war went on. The armies came to depend ever more upon heavy artillery and to use it more recklessly. East of Rheims where the line was nearly stationary for four years, there remain of the former villages only heaps of masonry. Even the sites of important churches, like Cernay-les-Rheims, can hardly be determined. One hunts among formless heaps of stone until one finds a voussoir from a rib or a capital then one knows one is standing where was once the church. The damage was also heavy during the advance and retreat of the Germans in 1918, as for example, in the beautiful little church at Crezancy.


FOURTH FLOOR PLAN, DOMINION ORTHOPAEDIC HOSPITAL, TORONTO.

A Secret of Bad Building

A correspondent of "The Times" of London, says: "Anyone who has been engaged in drawing and measuring a mansion, say of the seventeenth or eighteenth century, must have been struck by the opulent scale and proportion of its details as compared with the most costly building of the same class erected in the present day. Yet the difference may be traced rather to a system than to any conscious intention on the part of architects, builders, and clients. In a word, the present-day building is erected 'by contract'; the seventeenth-century building was not.

"Where first the idea took possession of the mind of the building owner that he must know the exact cost of his building in advance and obtain a legal contract for the carrying out of it for a specified sum, the building contractor, of course, for the protection of his own pocket, must know exactly what amount of each material used in the building he had to supply; hence arose the operation called 'taking out the quantities.' In the first instance this quantity-taking was done by the builder at his own cost, as a means of self-protection. But the time came when the builders, as a class, rebelled against this tax on their time, and required the 'quantities' to be supplied to them at the cost of the building owner. Hence arose the separate profession of the 'Quantity Surveyor.' Now on top of all this comes the desire of the building owner to get his building as cheap as possible; so the quantities are supplied to a selected number of builders, who are invited to state respectively for what sum they will carry out the building, and (unless there has been a special *caveat*—'the lowest tender not necessarily accepted') he who will do it cheapest is selected, with the result sometimes that the selected builder leaves himself so narrow a margin for profit as to be under a painful temptation to scamp the workmanship in some way not too obvious to the eagle eye of the architect.

"Thus architecture, which should be a great and noble art for the embellishment and pride of cities, and carried out with that object pre-eminently, is reduced to a kind of business of getting a presentable result at the least possible cost, and in general, it may be added, in the shortest possible time, for in too many cases (in town architecture especially) a new building is regarded by its promoters not as architecture but simply as 'property'; on which money has been expended, and which must be hurried up in order to make money returns out of it as early as possible. An essentially commercial generation may argue that this is the only logical, reasonable, and business-like method of procedure. It may be business, but it is not architecture. Not on such a system will arise such a civic architecture as will leave 'no complaining in our streets.' No great architecture ever has been or ever will be produced on the basis of building as fast and as cheaply as possible."

Commenting on the foregoing, the "Architect," of London, says that with much of this, many builders and most architects will be in complete agreement; but the unduly heavy scantlings used in the seventeenth and eighteenth centuries were consequent on a very rudimentary knowledge of stresses.

Ontario Housing Report

PROGRESS made under the Ontario Housing Act is reviewed in a report issued by the Bureau of Municipal Affairs, which contains a large amount of general information based on the practical application of the Act since it came into operation.

According to the report there are now ninety-nine municipalities which have passed by-laws under the provisions of the act and appointed housing commissions. Of these, nineteen are cities, forty-nine towns, seventeen villages, and fourteen townships. Sixty-eight municipalities have constructed houses. All these contemplate construction on a much larger scale this year. In addition, all the municipalities with two exceptions, which have not yet constructed houses, intend to do so this year.

This does not include the city of Toronto, which carried on operations independent of "The Ontario Housing Act," under a Housing Commission of its own, and which has constructed a number of houses, the financing of which has been done by the city itself.

The report also refers to a number of private companies which have incorporated under "The Housing Commission Act" for the purpose of erecting houses at Hawkesbury, Hamilton, Fergus, Iroquois Falls, Listowel, Kitchener and Waterloo. Riordon Annex Housing Company, Ltd. (Hawkesbury), the Fergus Housing Co., Ltd., Iroquois Falls Housing Co., Ltd., and the Listowel Housing Co., Ltd., are the only ones, however, which have so far carried out housing developments.

Regarding the matter of appropriations, it is pointed out that the total amount appropriated to municipalities by the province in 1919 was $10,629,000. Of this, $5,125,000 was appropriated to seventeen cities; $3,649,000 was appropriated to thirty-nine towns; $735,000 was appropriated to sixteen villages, and $1,120,000 was appropriated to eleven townships.

It is estimated that if all the requirements of the various municipalities for 1920 are met, $8,000,000 will have to be provided in addition to the above stated amounts. A large number of municipalities which constructed a small number of houses in 1919 are contemplating large developments this year, providing a sufficient appropriation can be made to cover their requirements.

Considering the short period that the act has been in operation and the fact that it represents an entirely new experiment in Canada, very substantial progress has been made. This is indicated in the following summary which shows the number of houses erected, their accommodation and physical character, the total loans granted and the average loan per house.

It will be seen from the above summary that of the dwellings erected 1,060 are detached houses and 124 semi-detached. It also shows that 62 per cent. of the houses erected are either brick veneer or of other type of solid construction.

The average loan per house indicates that there is a reasonable margin of security in the loans made. About two-thirds of the houses have been erected by persons who own their own lots. While it was possible for persons possessing their own lots to obtain loans for the full cost of the house, in a large number of cases the loans have been made for less than their full value. In houses built under this plan those building them were privileged to make their own contracts for construction. Working men were also allowed to do part of the construction work themselves, and this has been done in many cases. The department has encouraged this method. Persons wanting houses have each obtained the particular kind of house which they desire subject to the minimum requirements of the department. There has been no effort to force upon people any particular style or type of houses. These methods, the administration feel, are largely responsible for the success which has so far been obtained under the Ontario Housing Act.

Summary showing total loans granted and the average loan per house for dwelling already erected.

No. of houses		Loans.	Average loan per house.
14	Four roomed, frame, clapboard finish	$ 27,700.00	$1,978.57
3	" solid brick, hollow tile or concrete	7,575.00	2,525.00
43	Five roomed, frame clapboard finish.	115,489.00	2,685.79
26	" frame, stucco finish	77,050.00	2,963.46
23	" brick veneer	67,270.00	2,924.78
44	" solid brick, hollow tile, or concrete	124,630.00	2,832.50
237	Six roomed, frame, clapboard finish.	662,299.00	2,794.09
88	" frame, stucco finish	257,274.00	2,923.57
230	" brick veneer	678,228.00	2,948.82
332	" soid brick, hollow tile, or concrete	1,185,000.00	3,569.28
13	Over six rooms, frame, clapboard finish	37,100.00	2,854.61
27	" frame, stucco finish	81,000.00	3,000.00
23	" brick veneer	56,675.00	2,464.13
81	" solid brick, hollow tile, or concrete	300,684.00	3,712.16
1,184		$3,677,974.00	$3,106.40

"Special attention has been given to the planning of the houses on the point of view of having no space wasted in unnecessary halls or passages. It has been the endeavor to have every inch of space in the house made available for living purposes. The houses have been planned so as to secure the maximum accommodation at the minimum of expense. They have also been planned so as to give as little labor as possible in connection with the care of them. The housewife has been saved all possible unnecessary going up and down stairs and travelling from one room to another, and the kitchen has been arranged so as to give her the minimum of labor there."

LAND VALUES AND DIMENSIONS OF LOTS.

As to the matter of sites for dwellings built under the Act, small and narrow lots have been discouraged. While in Toronto and vicinity the values of lots are unusually high, comparatively speaking, there has not been much difficulty in securing land at reasonable prices elsewhere in the province for housing purposes. In this respect, according to report, the special provisions of the Housing Act in regard to the appropriation of land for housing purposes have been very effective. There have only been two arbitrations under these provisions, but the very existence of them has in a great many municipalities enabled lots to be purchased at a reasonable price, where otherwise this might not have been the case. As a rule, outside Toronto and its vicinity and the Windsor district, the lots used for housing purposes under the Act are not less than 40 feet frontage by 100 feet in depth.

As to the extent and value of land purchased for the purpose of erecting houses by the respective commissions, as well as the average cost per lot, this is set forth as follows:

Value of land in various parts of Ontario, as based on sites purchased by local commissions for the erecton of houses.

					Averaging, per lot.
Acton	7	lots	for $	2,000.00	$285.71
Brantford	10	"	"	3,000.00	300.00
Elmira	4	"	"	640.00	160.00
Galt	5	"	"	1,250.00	250.00
Guelph	11	"	"	2,830.00	257.27
Hawkesbury	33	"	"	9,900.00	300.00
London	9	"	"	2,350.00	261.11
Milverton	8	"	"	1,400.00	175.00
New Toronto	48	"	"	22,368.75	466.02
Oshawa	153	"	"	24,825.00	162.25
St. Catharines	22	"	"	4,645.00	211.14
Sudbury	17	"	"	10,200.00	600.00
Welland	4	"	"	1,425.00	356.25
Ottawa, 42 acres (or 328 lots)		"	"	162,000.00	493.90
Total	659	"	"	$248,833.75	$377.59

"In the case of Ottawa the price of land includes $40,000 for the laying out and development of it by the commission. The average price of $377.85 per lot is approximately $10 per foot frontage, and is reasonable. Where blocks of land have been purchased, these have been subdivided, laid out and developed. A considerable portion of this land has not yet been built upon. It is proposed to do this in 1920. Several other commissions are also contemplating the purchase of similar blocks of land for housing purposes."

The price of the houses erected throughout the province under the Act includes, in each case, hot air, heating, plumbing, bath-room equipment, and all other charges necessary for a complete house, the loans granted in a large number of cases approximating the cost of the buildings.

With reference to the advance in prices as regards materials and labor, the report states that the cost of constructing houses is now, taking an average of every province, about 125 per cent. greater than before the war. Lumber has so greatly increased in price that a stage has been reached where the cost of erecting a house of solid brick is not a great deal in excess of one of frame construction. It therefore urges on the grounds of durability and saving in maintenance, the advisability of adopting the more substantial type, stating that the comparatively small additional increase in cost of monthly payments over what is required for frame construction, can readily be made by those who are building.

Of the direct benefits accruing to those who have taken advantage of the Act, besides providing much needed accommodation, attention is drawn to the fact in nearly every municipality where houses have been erected the monthly payments for principal and interest, including taxes and insurance, are less than the rental for similar houses in the same municipalities.

REPORT OF CHIEF ARCHITECT.

The report of Mr. James A. Goven, Chief Architect under the Act, forms an interesting part of the summary, both on account of the study which he has personally given to the subject and the fact that all plans have come to his attention for approval. According to Mr. Goven, the various housing commissions operating throughout the province during the past year should be congratulated on the advance they have made and should receive every encouragement to go further in their good work, for which, he states, in too many cases they have received much criticism and no active help from professional bodies which could do so much by cooperating.

A steady improvement was to be noted in the quality of the plans received with each succeeding month, and it was quite evident that where competent professional assistance was obtained by a commission mistakes were avoided, economies effected and results produced which more than justified the expenditure for such service. While co-operation between the local branches of the architectural and are associations, societies, etc., might produce desired improvements, it is not considered that a central bureau to pass judgment on the aesthetic merit or demerit of each plan submitted would not be desirable.

Based on the experience gained through work already carried out, Mr. Govan makes a number of important recommendations which are intended to develope a keen practical interest on the part of the owner in his project, and to effect certain economies in construction and plan.

"Of the total number of loans made last year a large proportion was to individuals for the erection of their own homes. While it is true that this is not an economical way to producing houses in large quantities in a short period of time, there are many reasons for encouraging this phase of the work under the Housing Act.

"Splendid results has been obtained by many applicants who have carried out a great deal of work on their own houses. This should be encouraged for at least two reasons, one, to develope craftsmanship, and the other, to help keep down the amounts required for loans. . . . It should be clearly understood that the man or woman contemplating the purchase of a house has a natural interest in its building which is not satisfied by simply presenting him or her with the front door key . . . . . the most lasting satisfaction will be got when they are allowed to exercise some control over the work from the development of their plans to its final realization as a home.

BUILDING HOUSES IN QUANTITIES.

In order to keep costs at a minimum, Mr. Govan advocates the erection of houses in quantities with standardized parts, declaring that this can be done and still provide necessary variety in external appearance. The report also points to the importance where houses are built in quantities of drawing the attention of the local commissions to the fact that in such cases they are not only building houses, but also a community, and the appearance of the street must be considered as well as each house. Continuing, it explains that in a small town the erection of fifty or a hundred houses is a large percentage of the total number in the town. If these houses are attractive they will be an asset, on the other hand, if they are poorly designed and badly situated they will detract from the appearance of the town as a whole, and are apt to become a liability and the beginning of a slum district.

"In some localities bungalows consisting of cellar and all rooms on the ground floor have been erected for less cost than houses of two storeys, having the same accommodation and built of similar materials. The only explanation which can be given is that with the present high cost of labor—the hoisting of materials to first floor and roof more than offsets the cost of the extra cellar and roof areas of the bungalow.

(*Concluded on page* 100.)

EXTERIOR VIEW OF ONE OF THE ACTIVE TREATMENT BUILDINGS ERECTED IN CONNECTION WITH THE ONTARIO HOSPITAL, AT WHITBY, ONT.

Canada's War Hospital Development

By J. H. W. Bower, B.A.Sc., General Superintendent, Engineering Branch.

[Editor's Note.—The following article is a partial reprint from the chapter entitled "The Engineering Branch," by J. H. W. Bower, B.A.Sc., which appears in the official Government publication entitled "Canada's Work for Disabled Soldiers." The original manuscript, which deals with the subject at great length, was too lengthy for entire reproduction here, but an endeavor has been made to give such matter as will indicate the general policy of Canada's war hospitals and the efficient manner in which their design and construction has been carried out by the Department of Soldiers' Civil Re-Establishment.]

THE general considerations which led to the policy of establishing a chain of hospitals has been previously reviewed at some length.

The effectiveness of the policy so established largely depended upon the rapid design and construction of the institutions proposed.

It was realized that this problem was one without precedent in the history of Canada, and that its actual working out must be one of experimentation. At the same time, the experimental stage could not prolong itself into a period of months or years, as the necessities were of an immediate nature, due to the rapid return of disabled members of the Canadian Forces from overseas. The Engineering branch of the Department was, therefore, immediately organized to take care of the work, in order that a central control within the existing organization might handle the many and varied problems that had to be faced.

This branch of the work came into being during the fall of 1916, and the success of its work is acknowledged by experts from other countries who have inspected the various institutions throughout Canada.

In Europe, hospital facilities became an immediate necessity at the commencement of hostilities. It may, therefore, be imagined that the large institutions erected for war purposes in France and England would form concrete examples of what should be followed in Canada. By the time the Department was faced with the hospitalization problem, plans and reports from war hospitals in France and England were available. These were surveyed in every detail, but it was found that climatic conditions in Canada prevented the very temporary type of structure from being used in this country. The type of structure generally used throughout England for war purposes, consisted of the lightest one-storey frame construction. The temperate climate of England and France made it unnecessary to have elaborate and complete heating systems installed, and for the same reason, the structural details of their buildings could be of the most temporary nature, provided the general inclemencies of the weather could be guarded against.

The climate of Canada being subject to great extremes, especially in winter, made it necessary that the institutions which were to care for sick and wounded men must be so constructed that they could be easily and economically heated. At the same time, it was realized that the Government could not justify the construction of institutions of a permanent nature, as a great many of the hospitals erected would only be in use for a comparatively few years.

Thus, the problem which confronted the Department was a unique one without precedent.

On the one hand, the usual type of hospital was out of the question, due to its high constructional cost. On the other hand, the purely temporary building was useless, due to the extreme climatic conditions encountered. An intermediary course was, therefore, adopted, and buildings were constructed along lines that might be termed "semi-permanent." It was found that buildings of this nature could be most economically constructed of two-storey heights. Generally speaking, the foundations of the buildings consisted of wooden or concrete posts, supporting a floor system designed to meet the proper loads. The walls of the superstructure were composed of studding, sheeted inside and out with T. & G. boarding, the interior and exterior sheeting being covered with two-ply of heavy building paper, and the

VIEW OF CAFETERIA SYSTEM IN ONE OF CANADA'S WAR HOSPITALS.

OPERATING THEATRE, NORTH TORONTO HOSPITAL.

finished interior surface being of some fire-resisting board, such as linabestos, gypsum fibre board, etc. The exteriors of the buildings were finished in stucco, applied to some such material as stucco board, lath board, metal lath, etc. The roofs of the hospital units were along the simplest lines possible.

The buildings, while having their general constructional members composed of inflammable materials, may be considered as being of the "slow burning" class. The interior walls and ceilings were composed, as has been noted, of fireproof materials which would materially resist the spread of a fire making a start within the building. The exteriors of the buildings, due to the stucco finish, were also fire resisting, the only wood visible being that of the window frames and cornice trims.

ONE OF THE STANDARD WARD UNITS IN CONNECTION WITH RENA MCLEAN MEMORIAL HOSPITAL.

While it was possible, by the adoption of the semi-permanent type of structure, to keep costs to less than half that of modern hospital construction, in so far as the actual buildings were concerned, the same degree of economy could not be consistently followed with reference to heating systems. These had to be of such efficiency as would meet the extremes in climate encountered during the Canadian winters. It was, therefore, necessary to go through practically the same course in installing heating and power plants as would have been encountered in work of a permanent nature. In war hospitals constructed in countries of more temperate climates, stoves were largely used for heating purposes. It was contended by some, that a similar procedure could be followed in Canada, provided the buildings were properly constructed. Such practice was proven to be most impracticable, and it was definitely shown that taking into consideration the fire hazard, the discomfort to patients, and the coal consumption from operating so many units, the use of stoves would prove to be so uneconomical and dangerous in operation, that the installation of complete heating systems was easily justified.

The provision of sanitation, ablution facilities, and all those requirements peculiar and necessary in the operation of hospitals, falls, to a large extent, within the same class as that pertaining to the heating system discussed in the previous paragraph. While great economy could be followed in the structural type of the building used, plumbing and ablution facilities had to be adequate and properly designed to meet all conditions. It was necessary that all institutions erected be supplied with the most up-to-date hospital fixtures obtainable, in order that those operating the institution might be properly aided in giving effect to their professional skill. One step towards economy in this direction was possible, and resulted in enormous savings to the Department. In civilian hospitals usually erected, vitreous china fixtures of expensive patterns have been used. The price of these fixtures during the period of the war, doubled and trebled, and were, at the same time, almost impossible to obtain. By close co-operation with manufacturers of sanitary equipment, iron fixtures were designed, on which was used an acid-proof enamel. This enamel would not deteriorate from the use of strong acids generally in use in institutions of this kind. The costs of these fixtures were only a fraction of that of the usual type. Their present excellent condition is proof that their anticipated qualities have been realized.

FOOD SERVICE DEPARTMENTS.

The problem of food service in any institution is one which probably gives rise to more criticism by the patients than almost any other feature. In the war hospitals built in Canada, kitchen and dining-room lay-outs were considered and planned with the utmost regard to detail. Efficient and economic food service is largely dependent upon the dietary branch, having at its command complete and up-to-date facilities for food preparation. It has been demonstrated that the complete kitchen units provided have given a service second to none in the country. The installation of up-to-date equipment such as jacketted kettles, electrically driven apparatus, Hobart mixers, potato parers, dish washers, equipment for the making of ice creams, specially designed pastry ovens, batteries of toasters, and so forth, made it possible for those in charge to render such prompt and satisfactory service that, generally speaking, criticisms from the patients have been very noticeable by their almost entire absence.

One of the somewhat unique features connected with food service in Canadian war hospitals was the early adoption of up-to-date cafeteria systems, utilized by those patients in the institution who were well enough to serve themselves. The cafeteria system was installed wherever possible, and it has met with unqualified success. The system was entirely satisfactory to the patients, and the saving effected by the reduction in the number of serving staff lowered the patient cost of food to a surprisingly large extent.

For those whose disabilities confined them to their bed, each ward was equipped with a complete diet kitchen. The main kitchen supplied food for the whole institution, and proper amounts were distributed to each diet kitchen by means of heated food trucks. The diet kitchens were properly equipped for the preparation of all special diets, and by the use of steam heated appliances, such as steam tables, etc., meals could be served at any specified time throughout the day.

EXTERIOR VIEW OF RECREATION BUILDING AT COBOURG HOSPITAL.

Economic food service is largely dependent upon the purchasing of food supplies in large quantities. This policy was made possible by the installation of mechanical refrigeration operating large refrigerators in specially designed store-rooms.

HOSPITAL APPLIANCES AND EQUIPMENT.

Reference, in the foregoing part of this book, has been made to the wonderful work of the physician and surgeon during the war. Any professional skill can only obtain its greatest efficiency when properly aided by the most up-to-date appliances and general conditions. Operating suites instituted in Canada's war hospitals were complete to the last detail. The major operating suite in an active treatment institution was designed to embody all necessary departments in proper relation to the operating theatre itself. Sterilizing equipment of proven efficiency was installed in every such unit. In short, every piece of equipment necessary to aid skilful work was incorporated in each lay-out. The same careful degree of thought was used in the planning and allocation of space for X-ray departments. Many features not usually encountered in this work were embodied in the plans, and the results obtained have proven their efficiency. Perhaps one of the features which may receive more special attention was the complete facilities afforded in certain of the institutions for the carrying on of hydro-therapy, electro-therapy and mechano-therapy. It is doubtful if more efficient and complete departments of this nature exist in any of the

A 32-BED PAVILION AT THE MOWAT SANATORIUM, KINGSTON.

INTERIOR VIEW OF ONE OF THE 32-BED PAVILIONS, MOWAT SANATORIUM, KINGSTON.

VIEW OF ONE OF THE PAVILIONS ERECTED AT MOUNTAIN SANATORIUM, HAMILTON.

civilian hospitals on this continent. Hydrotherapy installations consisted generally of continuous baths, arm and leg baths, Scotch douche with control table, steam cabinets, and so forth. The electro-therapy branch of the work was equipped with every appliance proven to be of value in the treatment of certain disabilities. Considerable space and equipment was allocated for the use of the massage department, in order that the efficiently trained staff specializing in work of this nature might give full effect to their professional skill.

For the carrying on of special work, such as examinations in eye, ear, nose and throat disabilities, each institution requiring such facilities was equipped with complete clinics in each branch of the work. In many of the institutions, a great deal of out-patient work was carried on. Complete dispensaries for the filling of prescriptions were installed wherever required.

The foregoing remarks bear generally on the facilities which provided the necessary conditions for the furtherance of professional skill. The monotonous routine of institutional life must of necessity be broken by periods of recreation if the patient is to remain happy.

RECREATION AND VOCATIONAL BUILDINGS.

In the larger institutions constructed, recreation halls, equipped with apparatus of all kinds for mental and physical amusement, were erected. These buildings were usually of the two-storey type, the top floor being utilized for the showing of moving pictures and for use as an open gymnasium for the benefit of those whose physical condition would permit them to indulge in such pastimes. The basement, or ground floor, of the recreation hall was usually

VIEW OF 100-BED INFIRMARY, ERECTED IN CONNECTION WITH TRANQUILLE SANATORIUM, TRANQUILLE, B.C.

equipped with billiard tables, bowling alleys, canteens, barber shops, libraries, reading rooms, and so forth. The theatre portion of the building was so arranged, with stage and curtain, that amateur or professional theatricals could be properly staged at any time. These excellent recreation facilities had a wonderful effect on maintaining that proper degree of happiness among the patients which is so necessary to the well-being of one who is undergoing treatment.

The progressive policy of the Government in re-training disabled men for new occupations has already been discussed in detail in a previous chapter. The activities of the Vocational Branch of the Department could not be made effective until such time as buildings were available in which to carry on academic courses and industrial re-training. In practically every city in Canada of any size, re-training classes were established on a large scale, and the work of providing accommodation for this work entailed considerable constructional activities.

In some places, vacant factories were procured and their whole interior remodelled to suit the conditions required. In other instances where existing buildings were not available, new structures had to be designed and erected, and considerable care and forethought was expended in making these suitable in every regard for the re-training of disabled men. This work did not, of course, call for so much original thought as that required in the design of hospitals, but speedy execution of the construction of new buildings and the alteration of those acquired was necessary in order that the work might go forward as rapidly as possible.

The pulse of an institution is centred in its power-house. As already mentioned herein, a central plant was employed in supplying heat, light and power to institutions which were erected. The central power-house was not only used for the supplying of heat, but very often where local rates made the procuring of electricity prohibitive, steam generating sets were installed and the institutions supplied with power and light. Included in the power-house lay-out was usually incorporated complete machinery for refrigeration which operated all cold storage rooms throughout the institution. In large institutions, where justified, complete laundry units were erected to take care of the hospitals' requirements.

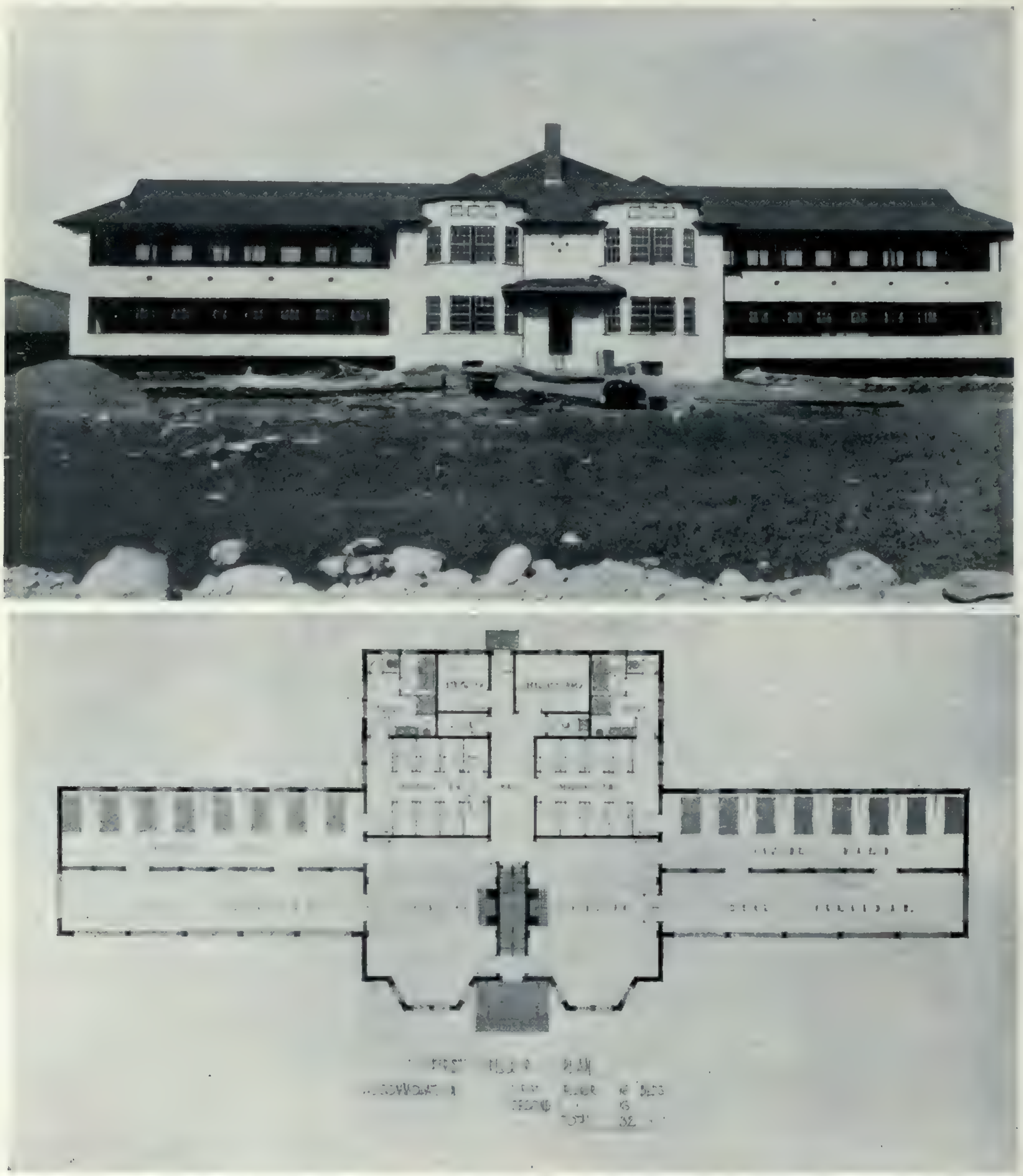
TYPICAL KITCHEN OPERATED IN CONNECTION WITH CANADA'S WAR HOSPITALS.

The work of the hospital programme laid out may be roughly divided into two groups: first, the provision of general hospital facilities which includes accommodation for convalescent and active treatment cases; the second natural division is that relating to the provision of hospitals for the treatment of those ex-members of the forces suffering from tuberculosis.

PROVISIONS FOR CONVALESCENT, ACTIVE TREATMENT AND TUBERCULAR CASES.

In the general hospital group, and distributed in proper relation amongst accommodation for convalescents and active treatment cases, comes the provision of accommodation for incurables, mental defectives, neurological types, and those cases requiring special treatment under special conditions.

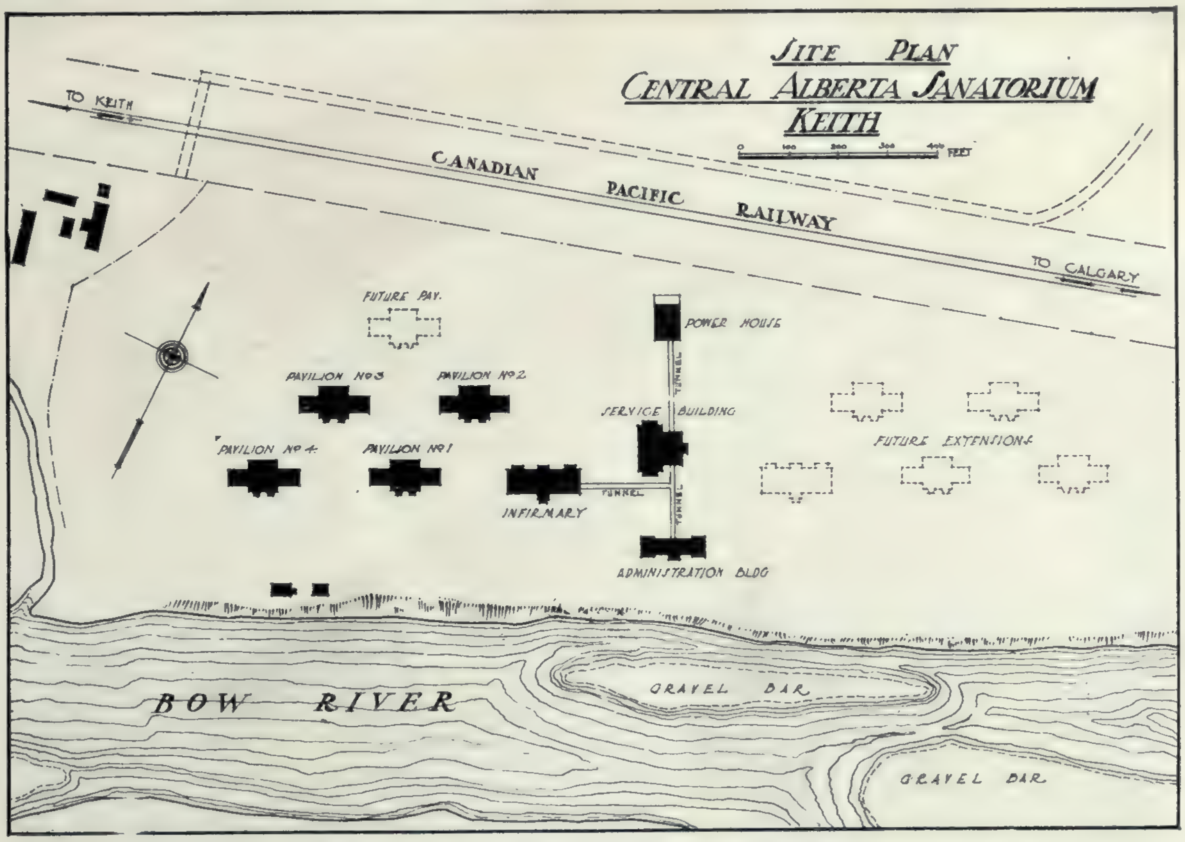
[Editor's Note.—The original manuscript, not given here, continues giving full description of the activities of the Government in providing hospital accommodation for convalescents, active treatments, incurables, mental defectives, neurological types, etc., etc. With very few exceptions, all hospitals included under these headings were planned and designed by the Military Hospitals Commission and its successor, the Department of Soldiers' Civil Re-Establishment, and by the end of March, 1918, some 12,000 beds were actually occupied and about 6,000 practically ready for occupancy. Due to change of Government policy, the Department of Militia and Defence took over the majority of these institutions, and the work on uncompleted institutions was carried on by the Public Works Department, who also made additions thereto and constructed some new centres as required. Descriptive matter bearing upon the general layout of these hospitals appears in another article in this book, and the original matter of this manuscript has therefore been omitted. The original manuscript, after dealing with the group of institutions giving accommodation for the cases above noted, continues in an exhaustive way to deal with the provision of sanatoria for those ex-members of the forces returning from overseas suffering from tuberculosis. Space here does not, however, permit of a reprint of all the text matter or illustrations in this connection, but the following will give a general idea of the policy which was adopted by the Department in providing sanatoria, and a portion of the manuscript given deals with a special type of pavilion for use in Western Canada. The description of this pavilion will give a general idea of the exhaustive manner in which planning was gone into.]



ONE OF THE DEPARTMENT'S NEW TYPE OF PAVILIONS DESIGNED TO MEET EXTREME CONDITIONS IN WESTERN CANADA.

The policy adopted by the Department in providing sanatorium accommodation for those suffering from tuberculosis, will prove of lasting benefit to the Dominion. Canada had, in pre-war days, a string of sanatoria from coast to coast which were variously operated by Provincial Governments or independent associations.

With the arrival of patients from overseas, it was very apparent that Canada's hospital programme with reference to accommodation for those suffering from tuberculosis, would have to be a very extensive and complete one, if the cases were to be properly cared for. Civilian sanatoria accommodation was full to overflowing, and it was impossible, therefore, to obtain admittance for the Department's patients to these institutions. At the same time, it seemed to be ill-advised for the Department to launch into a programme of erecting sanatoria throughout the length and breadth of the country, without looking toward the final use to which these institutions might be put.



BLOCK PLAN OF CENTRAL ALBERTA SANATORIUM, DESIGNED BY THE DEPARTMENT AND ERECTED JOINTLY BY THE PROVINCIAL AND FEDERAL GOVERNMENTS.

The Department finally succeeded in obtaining the co-operation of those in charge of various sanatoria already established, in making extensions to existing facilities. The co-operation thus afforded was usually in the manner of a substantial contribution toward the cost of such extensions, the buildings so erected to finally revert to the control of civilian institution. By this procedure, great economy in the provision of tuberculosis accommodation throughout Canada was possible. In many cases, it was found possible to add considerable bed accommodation to institutions without materially increasing the general services. Such opportunities meant that the Department had the advantage of a large investment without the attendant first costs.

Always having in mind the more or less permanent nature of the sanatoria accommodation to be provided, it is possible that even more research work was done in the matter of planning these institutions that that followed in the general hospital work.

The design of accommodation for infirmary and incipient cases as finally followed by the Department, has practically revolutionized sanatoria lay-outs in Canada. From a comparison of the Canadian plans with those of other countries, it is doubtful if any of these later institutions show the same thought and care as evidenced in the designs of those prepared by the Department. Sanatoria superintendents and professional men expert in the treatment of tuberculosis, were constantly in consultation, and an endeavor was made to arrive at and incorporate the best ideas available. Some of the prominent institutions in the country to the south were visited with a view to ascertaining the best practices followed in that country.

A new type of pavilion peculiarly adapted to the rigorous climate of Western Canada has been adopted, and specialists claim that it is one of the best that has yet been attempted. Provision of adequate infirmary accommodation has also been made, and this building incorporates the newest features considered desirable

PATIENTS DINING ROOM, NOVA SCOTIA SANATORIUM, KENTVILLE, N.S.

for the furtherance of the treatment of cases in the advanced stages of tuberculosis.

A NEW TYPE OF PAVILION.

The general services of the institution were so designed that the institution could finally take care of 500 patients. Having in view the ultimate use to which this institution would be put, namely, the care of the general public of the Province of Alberta, the lay-out of the institution was arranged to properly provide male and female accommodation. The buildings are divided into two groups—each group consisting of a number of pavilions for incipient cases, and an infirmary building providing the proper proportion of beds to take care of the advanced cases in each centre. Both groups are under the direct control of one administration building which, in turn, is in direct communication by underground tunnels with the service buildings, the infirmaries, and the power-house.

The administration building lay-out embodies all features necessary in the business management and control of a centre of this kind, and in it are installed complete operating suites, clinics, treatment rooms, X-ray departments, and so forth, for the whole institution. This method of centralization is somewhat of a de-

CAFETERIA COUNTER, NOVA SCOTIA SANATORIUM, KENTVILLE, N.S.

parture from the usual custom which has generally been followed in civilian institutions, it being usual to place such facilities in the infirmary. This, however, in a lay-out such as that planned for Central Alberta Sanatorium, would prove uneconomical, inasmuch as the existence of two infirmaries would necessitate the duplication of equipment and general control. The service building, which will ultimately contain two large dining-rooms, is designed to give to those patients who are well enough to walk to their meals, food by the cafeteria system. The central kitchen in this building will prepare all food for the entire institution, and food will be delivered to the infirmaries in heated food wagons through underground tunnels. The power-house to the rear is also connected with the main group of service buildings by a tunnel, and embodies all those features necessary in a complete power-house unit. Arrangements are pending with the Canadian Pacific Railway, whose main line is in the vicinity of the institution, to run a spur to the power-house, so that coal may be delivered with the least handling possible.

CENTRAL STORES BUILDING AT THE SPEEDWELL HOSPITAL, GUELPH, ONT., IN WHICH HOSPITAL EQUIPMENT AND SUPPLIES ARE CARRIED FOR USE IN ALL OF THE DEPARTMENT'S INSTITUTIONS.

WAR HOSPITALS AND CIVILIAN NEEDS.

[Editor's Note.—The following extract from the original manuscript deals with the possibilities of following in part Canada's War Hospital Programme in providing sufficient accommodation for civilian needs.]

The carrying out of the Department's policy in reference to hospital accommodation, is perhaps one of the most extensive schemes of its kind that has ever been carried to a successful conclusion under one central organization in Canada. Its success was largely due to the farsightedness and capabilities of the late Deputy Minister of the Department, Mr. Samuel A. Armstrong. Mr. Armstrong, previous to his connection with war work for the Federal Government, was Assistant Provincial Secretary of of the Provincial Government of Ontario, and during his period of office with the Province, promoted many large schemes for the hospitalization of the populace of Ontario. The Chief Architect of the Provincial Secretary's Department of Ontario, Mr. Jas. Govan, was also largely instrumental in a consulting capacity, in reference to the formulating of original schemes for Canada's war hospitals. While Mr. Govan was never actively engaged by the Department, his advice was often sought. The general merits of the work can be generally attributed to the faithful and untiring efforts of those men who were actively engaged in the work. Special mention may here be made of the untiring attention and close application paid by Mr. W. L. Symons to the work during the period that he was on the staff of the Department.

Canada's type of war hospital, as already stated herein, was evolved after most careful consideration had been given to the problem. The scheme adopted was largely on account of the necessity of keeping constructional expenditures to the absolute minimum. During the operation of the institutions, other facts have become apparent, and it has been found that their operation and general upkeep has been maintained with just as much ease, and possibly with more economy than hospitals erected for civilian purposes during pre-war days.

When it is considered that the patient day costs in Canada's war hospitals does not surpass, and is probably less than similar costs in other institutions, and when this consideration is coupled with the fact that the capital expenditure involved approximates less than 50 per cent. of what ordinary institutions cost in pre-war days, one immediately realizes that here is an object lesson, a careful study of which may lead to solving the difficult problem of providing Canada with sufficient institutions to properly meet the needs of its population.

There is a great lack of civilian hospital accommodation in Canada at the present time, and if proper and adequate facilities are to be provided, some very progressive programme will have to be instituted.

INTERIOR VIEW OF CENTRAL STORES BUILDING AT GUELPH, SHOWING THE TIER ARRANGEMENT OF FLOORS, ADOPTED TO FACILITATE EFFICIENT HANDLING OF STOCK.

Those who are responsible for the public welfare, while realizing the necessity of accommodation, are loath to promote constructional projects that would properly meet the situation, on account of the enormous increase in construction and material costs. Even before the war, the erection of hospitals and institutions involved expenditures that invariably raised the tax rate apparently out of all proportion to the facilities afforded. Only our larger cities seem to have been able to finance the erection of institutions that would afford the most up-to-date facilities.

One step toward solving the cost of institutional work is seen in the Community Hospital Movement. This proposal puts forth the idea of establishing central institutions which will serve a number of neighboring municipalities. It is believed that this step is one in the right direction, and if the proper degree of inter-municipal co-operation is maintained, there is no reason why such projects cannot be carried to a successful finality. To-day, with our advanced facilities for transportation, the good roads movement, and the almost universal use of motor transport, the community hospital, serving a number of municipalities, is an idea which, if carefully worked out, should give the desired results.

There is another phase of institutional work which, in these days of "monolithic" structures, seems to have been passed unnoticed by those who are most affected. Civilian hospitals erected in pre-war days have generally been of the "monolithic" or multiple storey type. Canada's war hospitals which represent an accommodation for nearly 20,000 men, have been commented upon most favorably by those in a position to criticize, as obtaining all those features of utility that go to make up an efficient working hospital. Due to the rapid advance that is continually being made in the science of medicine and surgery, the useful life of an institution is a comparatively short one. We have evidence of this at every hand, inasmuch as hospitals constructed comparatively a few years ago are now out of date, and professional men are urging the provision of more up-to-date facilities. The unit type of hospital, as followed

(*Concluded on page* 101.)

CONSTRUCTION

A · JOURNAL · FOR · THE ARCHITECTURAL
ENGINEERING · AND · CONTRACTING
INTERESTS · OF · CANADA

H. GAGNIER, LIMITED, PUBLISHERS
Corner Richmond and Sheppard Streets.
TORONTO - - - - CANADA
M. B. TOUTLOFF, Editor

BRANCH OFFICES:
MONTREAL—171 St. James Street,
E. R. Milling, Representative.
WINNIPEG—336 Qu'Appelle Street,
F. C. Pickwell, Representative.
NEW YORK—505 Fifth Avenue,
H. M. Bradley, Representative.

CORRESPONDENCE.—All correspondence should be addressed to "CONSTRUCTION," Corner Richmond and Sheppard Streets, Toronto, Canada.

SUBSCRIPTIONS.—Canada and Great Britain, $3.00 per annum. United States, the Continent and all Postal Union countries, $4.00 per annum, in advance. Single copies, 50c.

ADVERTISEMENTS.—Changes of, or new advertisements must reach the Head Office not later than the twentieth of the month preceding publication to ensure insertion. Mailing date is on the tenth of each month. Advertising rates on application.

CONTRIBUTIONS.—The Editor will be glad to consider contributions dealing with matters of general interest to the readers of this Journal. When payment is desired, this fact should be stated. We are always glad to receive the loan of photographs and plans of interesting Canadian work. The originals will be carefully preserved and returned.

Entered as Second Class Matter in the Post Office at Toronto, Canada.

WESTON WRIGLEY, Business Manager
FRED. T. HOLLIDAY, Advertising Representative

Vol. XIII Toronto, March, 1920 No. 3

Canadian Materials and Foreign Products

Such views as have been expressed following the letter recently sent out by the executive of the Ontario Association in reference to the employment of outside architects for the use of foreign products in the erection of Canadian buildings, are quite in accord with the sentiments that everything possible should be done to encourage Canadian resources. The statement is made that the profession has always supported any policy which aimed to promote Canadian interests, and that all things being equal, preference has always been given to Canadian materials. It is contended, however, that it is at times difficult to use Canadian goods exclusively, due to the fact that certain necessary materials are not produced in Canada, and because in certain competitive lines, foreign products are considered of better quality.

In this connection attention is drawn to the fact that there is no Canadian-made roofing on the market, although there is an abundance of raw material. The result is that the only satisfactory fireproof roofing material of this character is the slate quarried in England and the United States, or the tile manufactured in those countries. It is also asserted that a considerable portion of Canadian-made goods are manufactured by firms in the United States and sold under Canadian names. Besides this it is said that the craftsmanship of some Canadian lines is not of a sufficient high standard. The contention is that it would be unwise on the part of the profession to foster a spirit that would accept any material on the basis that it is "good enough" simply because it is of Canadian manufacture.

All this is true to the extent which at times makes it necessary for architects to specify goods other than of local manufacture. It is likewise necessary to import architectural terra cotta and certain marbles. On the other hand it is generally recognized that Canada is in a position which should enable her to fully meet her own requirements as regards most basic materials. There are a number of industries producing brick, hollow tile and cement of a quality which should make it unnecessary for anyone to go outside of the country in order to meet their needs. Also manufacturers of electrical goods, hardwood flooring, paints and varnishes, builders hardware, etc., which produce high-grade materials. A very excellent granite is quarried in Quebec, as well as the marble which has been successfully used in a number of important buildings. The position of the country in this respect can be extended to cover many other lines, such as plumbing goods, heating apparatus, steel sash, as well as building stone produced in various parts of the Dominion.

A recapitulation in fact shows a wide field of resources susceptible to still greater industrial possibilities. To encourage the development of these resources is the duty of everyone concerned with building construction. At the same time no manufacturer has a right to assume that simply because his goods are produced in Canada that they are entitled to special consideration on that account alone. Architects must of necessity protect their own reputation and the investment of their clients, and in giving consideration to the materials to be used, it is conforming to sound economic practice to insist that made-in-Canada goods are equivalent to the best. The obligation rests with the manufacturer to produce the right quality of goods, and with Canadian architects to specify them.

◆

Architects Confer with Customs Board

Members of the Royal Architectural Institute of Canada recently conferred with the Customs Board at Ottawa with a view to securing the revision of the basis of appraisal on imported architectural and engineering plans to provide conservation of the opportunities arising in Canada for Canadian architects and engineers.

Ontario Housing Report

(*Continued from page* 86.)

"Sufficient educational work has been done under the Act to show that houses three rooms deep are not necessary or desirable except on unusually wide lots or, in very special circumstances, on very narrow lots. No exceptions will be made to the side clearances demanded in the "Report re Housing," printed last year, in checking plans of the three room deep type unless the middle room has a window to the rear in a break in line of side wall.

"Too much attention cannot be given to the placing of houses on lots so that they will get the full benefit of direct sunlight into as many rooms as possible, especially during the winter months, when it is almost impossible to get sun purified air into homes through open windows and doors.

"In many cases the placing of a verandah right across the front of a house has the effect of shutting sunlight out of a room throughout the entire year. This should be emphatically condemned in our climate where the ordinary verandah can only be used for a very few months of the year at most.

"Low cost housing can only be obtained by eliminating every foot of waste space. This has the inevitable effect of restricting the size of the kitchen. As this is the workroom much greater attention should be given by planners to the traffic lines through the kitchen and the relation between door openings and furniture spaces.

"It has been only too evident during the past year that these features have not been given a sufficient amount of consideration. A small kitchen is only satisfactory when traffic lines will leave enough wall and floor space to accommodate the furniture which is essential for the work to be performed.

"When this point has been studied it will be found that it is rarely desirable to provide a separate door opening right out to the rear of the lot, in addition to the grade entrance to the cellar, which should also communicate with the kitchen."

Other recommendations of Mr. Govan refers to further desirable economies of plan and construction, such as simplicity of roof construction so as to eliminate the cost of hips, valleys, flashings, etc., the placing of upper floor partitions over those on the floor below, the arrangement of plumbing fixtures for bathroom, kitchen and laundry so as to make only one soilstack necessary, as well as the questions of ventilation and insulation.

CONSIDERATIONS AS REGARDS THE QUESTION OF SITES.

Information of special value to Housing Commissions in the preliminary stages of their developments is contained in the report of Messrs. Harries and Hall, town planners, which forms an important part of the general summary. This part of the report points out that the needs of no two municipalities are exactly alike. Land values and construction cost vary widely with the number of vacant sub-divided lots within a municipality, and the degree to which they are already served by municipal improvements. The location of industries within a municipality is necessarily a governing factor in advising the Housing Commission whether (a) to accept only applications of individuals; (b) to accept only applications of housing companies; (c) to purchase only land en bloc for subdivision and turn the lots over to applicants at cost; or (d) whether to adopt two or all of the above policies.

The report deals quite extensively with the subjects of block plans for housing projects in subdivisions as well as regards individual lots, and the necessity on the part of local commissions to take levels and prepare a topographic plan showing all existing trees, building and rock outcrops as well as all adjoining streets and streets intersecting the boundary streets.

"Many things tending towards economy can be easily arranged for, if the location and floor grades of the houses are studied generally, in relation to each other, together with the requirements of grades necessary for economical development. The block plan makes it possible to select housing locations reasonably close together, so that the contract for a number of houses of the same type may be awarded and constructed, and a second contract may later be awarded for houses of a different type, which can be placed between those first erected. In this way, the danger of too close duplication of houses of the same type prevalent in quantity production can be overcome."

The report also deals with the question of light and air, and as to how the matter of light can often be improved by inverting the plan of a house. Also with the placing of houses on adjoining lots which can be so arranged that service walks for both houses may be adjoining, with a later possibility of the walks being used for runways for future garages. Where applications for houses on adjoining lots are submitted at different times, the report advises against too frequent duplication of the same front elevation along the street.

Additional matter takes up the width of streets, property lines, main and secondary streets and their development as regards traffic requirements. Referring to open spaces such as parks, playgrounds and other recreational areas, it is pointed out that these can be provided at less cost to the individual, if considered in the subdivision of the project. To do otherwise means that if these features are desired the applicant will be required to pay for them through the tax rate at a future time, with the chance that they will not be as desirably located.

LOCAL IMPROVEMENTS.

Another part of the report prepared by R. O. Wynne Roberts, Consulting Sanitary Engineer, deals with the question and local improvements, which gives, in part, the following advice to local commissions:

"It is highly advisable that the Local Housing Commissions should insist upon a pure and sufficient supply of water for domestic and fire purposes. They should also urge that the new houses should have internal sanitary accommodations, sewer connections and dry foundations. In some instances water is available only by sinking wells, and sewage is disposable by building septic tanks and distributing tiles. When a number of houses are built on adjoining lots it is difficult to see how the purity of the water or the sanitary condition of the lots, especially in dense soil, can be properly safeguarded. Moreover, one of the proposed Provincial Board of Health regulations is that no tile sewage disposal system shall be within 150 feet of the source of any water supply, whether it be on the same or adjoining property. Wells and septic tanks should be at opposite ends of the lots. If this is not possible or the conditions are not favorable, then it is desirable that an earth closet or other satisfactory sanitary accommodation should be located as far distant from the well as possible. The point which I desire to make is that new houses should, as far as possible, be located where municipal watermains and sewers are available, or are likely to be laid in the immediate future, and thereby enable the home builders to avoid the risks due to polluted wells and unsatisfactory private sewage disposal works.

"It is advantageous for efficient municipal administration to have compactly built up cities, towns and villages. If any city, town, or village spreads out unduly, the mileage of watermains, sewers, sidewalks and other municipal works must sooner or later be increased without adding much to the revenue, or the sanitary conditions may not be satisfactory. Furthermore, when sewers and watermains are extended, the houses have to be connected thereto and the wells and septic tanks have to be abandoned, and thus the cost of the housing scheme is increased."

Canada's War Hospital Development

(*Continued from page 98.*)

by Canada for war purposes, would appear to more nearly meet the situation than any other possible scheme. The buildings are of cheap construction, but at the same time their interior arrangement and finish provides every facility required. Extensive constructional methods and elaborate use of bricks and mortar do not aid in the recovery of the patient. It would seem, therefore, that the logical conclusion arrived at in the solving of Canada's future hospital policy, is that designers should confine themselves to the least possible capital expenditure, so as to permit of procurable funds being readily available for the proper maintenance and professional care of the patient. Reduction in capital expenditure means reduction in hospital rates. Reduction of capital expenditure will make funds available for improved services. It will surely be conceded that money expended in providing increased numbers of medical staff and nurses, accrues directly to the benefit of the patient, whereas such money sunk into elaborate building methods, is lost entirely, in so far as the well-being of the patient is concerned.

It is not to be concluded from these remarks that the erection of inflammable structures is recommended. Institutions composed of unit buildings of one storey height, or at the most two, will permit of the lightest possible type of fireproof construction. The exact type of construction to be used is a matter dependent upon too many considerations for full analysis here. Economy lies in the policy of using unit buildings to obtain the required accommodation instead of multiple storey construction.

Who can foretell what the ideal type of hospital will be in the course of the next few years? Conditions that were considered ideal a comparatively short time ago, have now been discarded. It seems probable that a similar advance will be made in the future years. To keep pace with this advance, if hospitals constructed to-day are designed and erected with proper forethought, regard to capital expenditure, and the probable length of their useful life, they may, when ideas have changed, be altered, extended, or even demolished, in order to meet the ever-changing requirements. Such facility of alteration, change or renewal could not possibly occur in a monolithic structure of reinforced concrete of the multiple storey type. Such a building, after its usefulness has come to an end, must be thrown into the discard, in so far as its use for a hospital goes.

The possibilities discussed in the preceding paragraphs are being entertained by experts, both on this continent and in Europe. The tendency of thought of many is toward the semi-permanent type of construction for future institutional requirements. It would appear that Canada's experience gained in its hospitalization programme confirms, to a large extent, the soundness of these views.

New Method of Heating Buildings

A new scheme for heating buildings, described as the application of the "aerofoil" theory, was advanced recently by Professor G. H. Bryan, speaking before the British Association at Bournemouth. He said that while working at the mathematical theory in connection with aeroplanes the idea of the aerofoil theory occurred to him, and the results obtained had agreed with the theory far better than had been anticipated.

His proposal, he said, was to place over every radiator in a public or private building a deflector, arranged at an angle determined by experiment. Without the deflector the hot air from the radiator was drawn up towards the window and so passed away from the interior of the room. But with the deflector in use the hot air was passed from its underside into the room in a free stream, while the mass of cold air between the outer side of the deflector and the window formed a non-conductor and prevented the hot-air from escaping through the window to the outside.

It was essential, he said, that the deflector should have a sharp edge, so as to secure a free stream of hot air; with a rounded edge eddies of hot air were produced which did not carry so far into the room.

◆

Cleaning White Marble

A writer in an English technical journal gives the following suggestion for cleaning a carved white marble statue: Should the dirt on the statue be due to the vegetation it may be removed by first washing over with soda water. While this is eating into the grime scraping with an old knife, accompanied by the free use of small pieces of gritstone, should be sufficient so far as the removal of the dirt is concerned. A copious use of clean water will complete the process. Another good marble-cleaning preparation is to take two parts common soda, one part powdered pumicestone, one part of finely prepared chalk, pass through a fine sieve and mix with water as needed. Rub the preparation well over the marble, then wash clean with soap and water. The marble may be polished with washed emery powder and putty powder, using a piece of linen rag in the process of spreading it on and rubbing.

◆

New Illinois Law Permits Partnerships Between Architects and Engineers

Registration and licensing of architects in Illinois, according to the "American Architect," are provided by a new state law amending previous laws and specifically permitting licensed architects to enter into partnership with licensed structural engineers. A company engaged in architectural work may not be licensed, but must have a registered architect at its head.

This law does not affect draftsmen and superintendents acting under the supervision of registered architects, but persons registered under this law are exempt from the provisions of laws regulating the practice of structural engineering. It does not apply to residential or farm structures outside of corporate limits or to structures costing not over $7,500 within such limits.

Examinations for license will cover design and construction, sanitation and ventilation, strength of building materials, and the ability of the applicant. The law describes a "building" as follows: "A building is any structure consisting of foundations, floors, walls, columns, girders, beams and roof, or a combination of any number of these parts, with or without other parts."

◆

Personal

H. S. Dowswell, A.R.I.B.A., and Charles Dolphin, late Captain, C.E.F., have formed a partnership for architectural practice under the firm name of Dowswell & Dolphin.

Mr. Dowswell is a graduate of the School of Architecture, McGill University, and until recently was chief draftsman for Ross & McDonald, Montreal, having previously occupied the position of assistant office manager with Carrerre & Hastings, New York City. He was also responsible for the Housing Report of the Ontario Government, and is at present carrying out the housing project for the Riordan Pulp and Paper Company at Hawkesbury, Ont.

Mr. Dolphin, with whose sketches our readers are already familiar, was also formerly with the firm of Ross & McDonald, in charge of design, and spent a year in travel and study abroad just prior to the outbreak of the war, in which he saw four years' service, having achieved distinction while in charge of the 5th Brigade Scouts, and being listed among the casualties at St. Eloi.

The new firm will maintain offices at both Toronto and Montreal.

——

Mr. Louis O. Secord and Mr. Herbert E. Murton have formed a partnership for the practice of architecture under the firm name of Secord & Murton, with offices in the Home Bank Building, 72 James St. N., Hamilton, Ont., and will be pleased to receive manufacturers' catalogues and samples.

CONSTRUCTION

April, 1920 Volume XIII., No. 4

CONTENTS

BANKERS' BOND BUILDING, TORONTO 105

CANADA TRUST BUILDING, TORONTO 108

MARKET BRANCH, HURON & ERIE MORTGAGE CORPORATION, LONDON, ONT. 109

LEAVES FROM AN ARCHITECT'S SKETCH BOOK 111
By Charles Dolphin.

MEMORIAL WINDOWS 119
By Arthur S. Dixon, M.A.

NEW ALLEN THEATRE, WINNIPEG 123

CO-OPERATION ENCOURAGED BY FIXED FEE PLAN 127
By F. A. Wells.

ART, AFTER THE WAR 130

EDITORIAL 131
Canadian Roofing Materials—Ontario Architects Increase Fees.

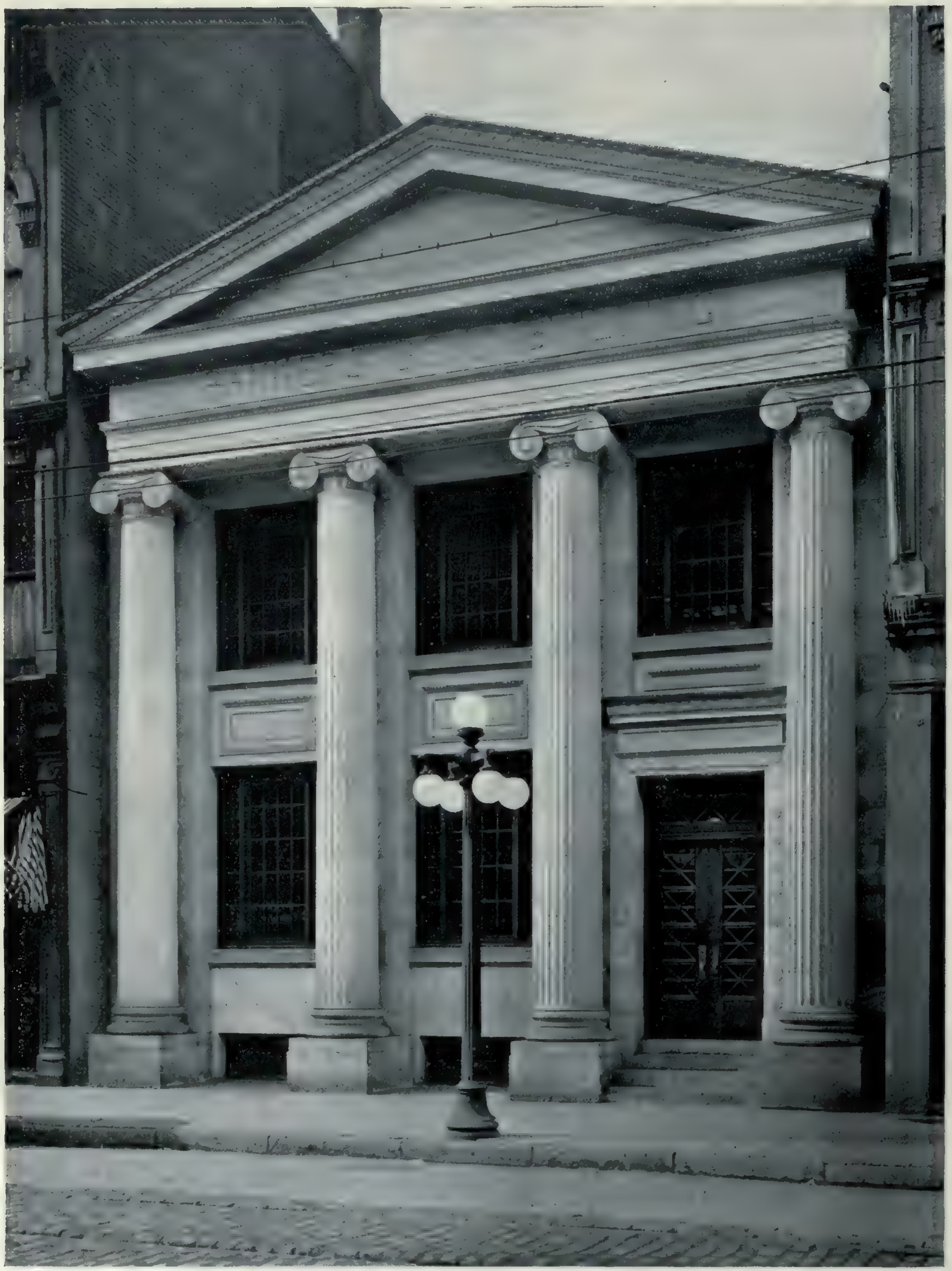
Full Page Illustrations

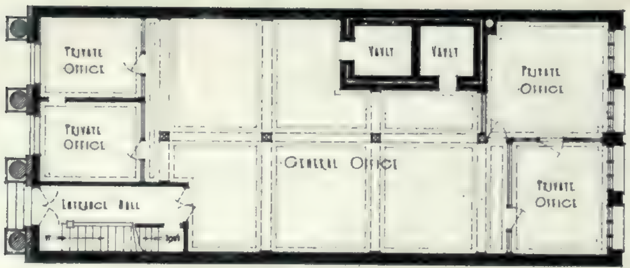
BANKERS' BOND BUILDING, TORONTO 104

CANADA TRUST BUILDING, TORONTO 108

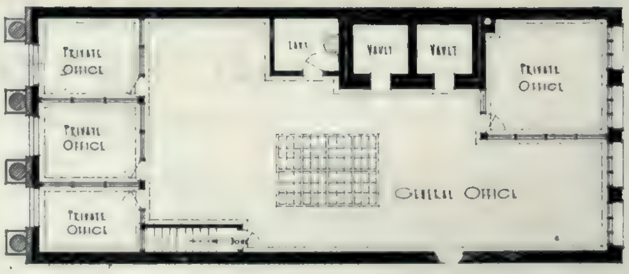
DETAILS OF OLD VENETIAN WORK 112

H. GAGNIER, Limited, Publishers
GRAPHIC ARTS BLDG., TORONTO, CANADA
BRANCH OFFICES
MONTREAL NEW YORK





GROUND FLOOR PLAN.



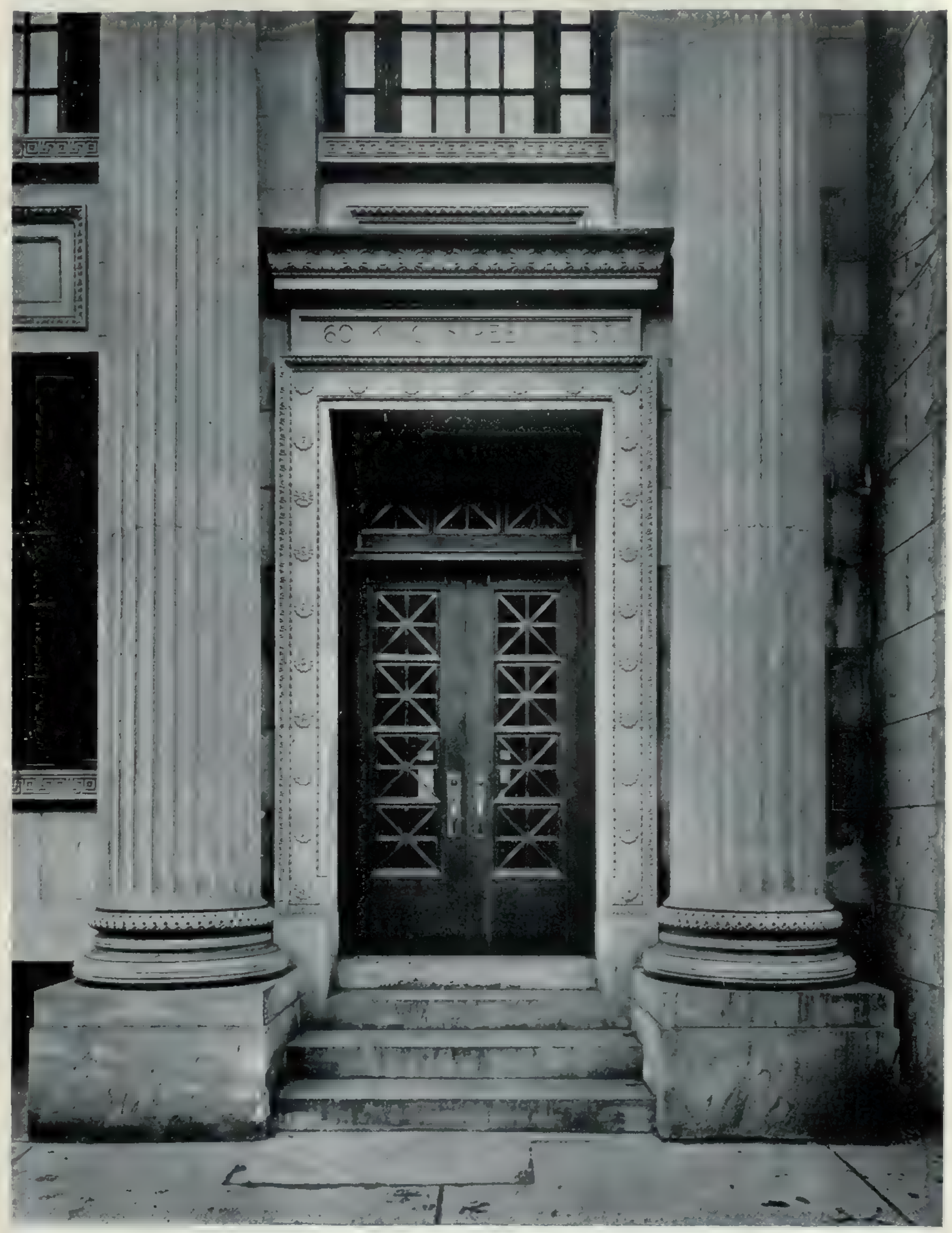
UPPER FLOOR PLAN.

BANKERS' BOND BUILDING, TORONTO.

J. A. MACKENZIE, ARCHITECT.

Bankers' Bond Building, Toronto

THE sky scraper, with its rows of office windows, must necessarily have a commercial appearance, a large earning capacity and numerous tenants. It is often relieved by columns on the lower storeys, and an ornate cornice on the upper, yet it is impossible to give it the refinement and dignity of lower and more monumental buildings, so much so that many leading financial institutions have restricted the height of their buildings, preferring something incorporating one of the Orders with the accommodation limited to their own requirements.



DETAIL OF ENTRANCE: BANKERS' BOND BUILDING, TORONTO.

Such is the new home of the Bankers Bond Company at 60 King Street West, Toronto. The problem of producing on a 33-foot city frontage a financial facade of a dignified and enduring character, has been solved by a worthy copy of the Erechtheium at Athens, one of the most refined and complete of the Greek Ionic temples.

The architect, J. A. MacKenzie, of Toronto, has studiously reproduced in Indiana limestone and bronze, some of the grace and rich carvings of this Grecian prototype, the sculptured ornament in particular being excellently done.

All work was executed from full size details and shaded studies of ornament. The shafts of the columns were turned and fluted at the Bedford quarries, and have a most delicate and graceful entasis from base to capital. The turned bases are enriched with a carved Guilloche member, while the Ionic capitals with their intricate volutes and honeysuckle ornament on the necking, are exceedingly rich and beautifully carved. The fine and precise fret ornament on the window sills is in perfect scale with the double sinkings of the volutes of the capitals, while Grecian egg and tongues replaces the egg and darts of the Roman orders.

The doorway, with its carved architrave and numerous rosettes, is crowned with a cyma recte moulding richly carved in Greek honeysuckles, making a rich, but dignified entrance.

The very refined cornice is entirely without brackets or medallions. The crowning number is executed in the Greek Acanthus leaf and rosette, but perhaps the most charming point of the whole design is the proportion of the entablature to the slender columns. The mass and slope of the pediment are just right for the supports, the inter-columnation and mass of the Erechtheium being closely followed. Square headed openings and a predominance of vertical lines in bronze windows harmonize perfectly with the narrow interspaces between the columns.

The entrance hall and stairway to the second

GROUND FLOOR OFFICES: BANKERS' BOND BUILDING, TORONTO.

floor are panelled in white marble with paved marble floor and verdi antique base. This entrance leads into the general office which is finished in gumwood, with plain square posts and shallow pilasters and beamed ceiling and glazed office partitions on simple and refined lines.

Both floors have well-lighted spacious offices with semi-indirect electric fixtures, fireproof vaults being provided on every floor and ample lavatory accommodation in the basement.

Window Protection

The types of modern window protection from fire may be divided into three classes, namely, water jets or open sprinklers, metallic shutters, and metal or metal-covered frames in combination with wired-glass. Open sprinklers, or "water-curtains," have been subjected to no very severe tests, although they are often advocated even to the exclusion of shutters. This dependence does not appear to be justified, as water is diathermanous and permits radiant heat to pass through it readily. The greatest value of open sprinklers lies in the reinforcement they provide for other measures of window protection, such as fire-resistant shutters and wired-glass windows.

Shutters have proved their efficiency in many fires, but they are unsightly. For rear walls of warehouses and factories they may be unobjectionable, but, in a building occupied by tenants, any systematic method of closing them would be hardly practicable. A further objection is the fact that, if such shutters are closed at night, internal fires may attain serious proportions before discovery. Rolling shutters of the normally open automatic type do not possess these objections, but they are far more costly to install. Shutters in any form should combine the following requisites: (a) Fire resistance; this is dependent upon the material of which the shutter is made and upon the way in which it is installed. (b) The ability to resist radiation of heat. (c) Capability of being opened from the outside. The last-named feature is essential, that firemen may have access to interior fires or that the shutters may be opened to permit

UPPER FLOOR: BANKERS' BOND BUILDING, TORONTO.

means of escape for entrapped inmates. Where the danger of exposure is not sufficient to necessitate the use of shutters, or, if their appearance is objectionable, wire-glass in metal or metal-covered frames forms a more pleasing though less efficient type of protection. Wire-glass windows, however, readily admit radiant heat, and are not to be recommended for severe exposures unless used in combination with shutters or outside sprinklers.

As a rule, with light exposures of first-class construction 75 feet or more distant, open sprinklers should be sufficient, except for a risk particularly dangerous in itself. If the exposure is moderate at 40 or 50 feet and the building is not specially hazardous, wire-glass would be preferable. If the exposure is severe and within 25 to 40 feet, tin-covered shutters should be used where attractive appearance is not essential. If the exposure is less than 25 feet distant, tin-covered shutters in combination with wire-glass or open sprinklers may be used.

◆

According to the London "Daily Chronicle," it is proposed to build a million-pound Dominion Club on the site of the famous Devonshire House, Piccadilly. The Duke of Connaught is said to be enthusiastic for the project, which originated with Sir Ernest Hatch. Plans for ladies' and men's sections of the club have already been drawn by the President of the Royal Academy, and show ample residential accommodation.

◆

B.C. Architects' Bill

The bill to incorporate the architects of British Columbia now before the Legislature of that province was recently given its second reading. The proposed enactment provides for a Board of Examiners to pass on the eligibility of those seeking to enter the profession, and admits only foreign architects to practice in the province who are residents of a state or country which recognize the standard of qualification set forth in the bill, and which accords British Columbia architects reciprocal privileges.

◆

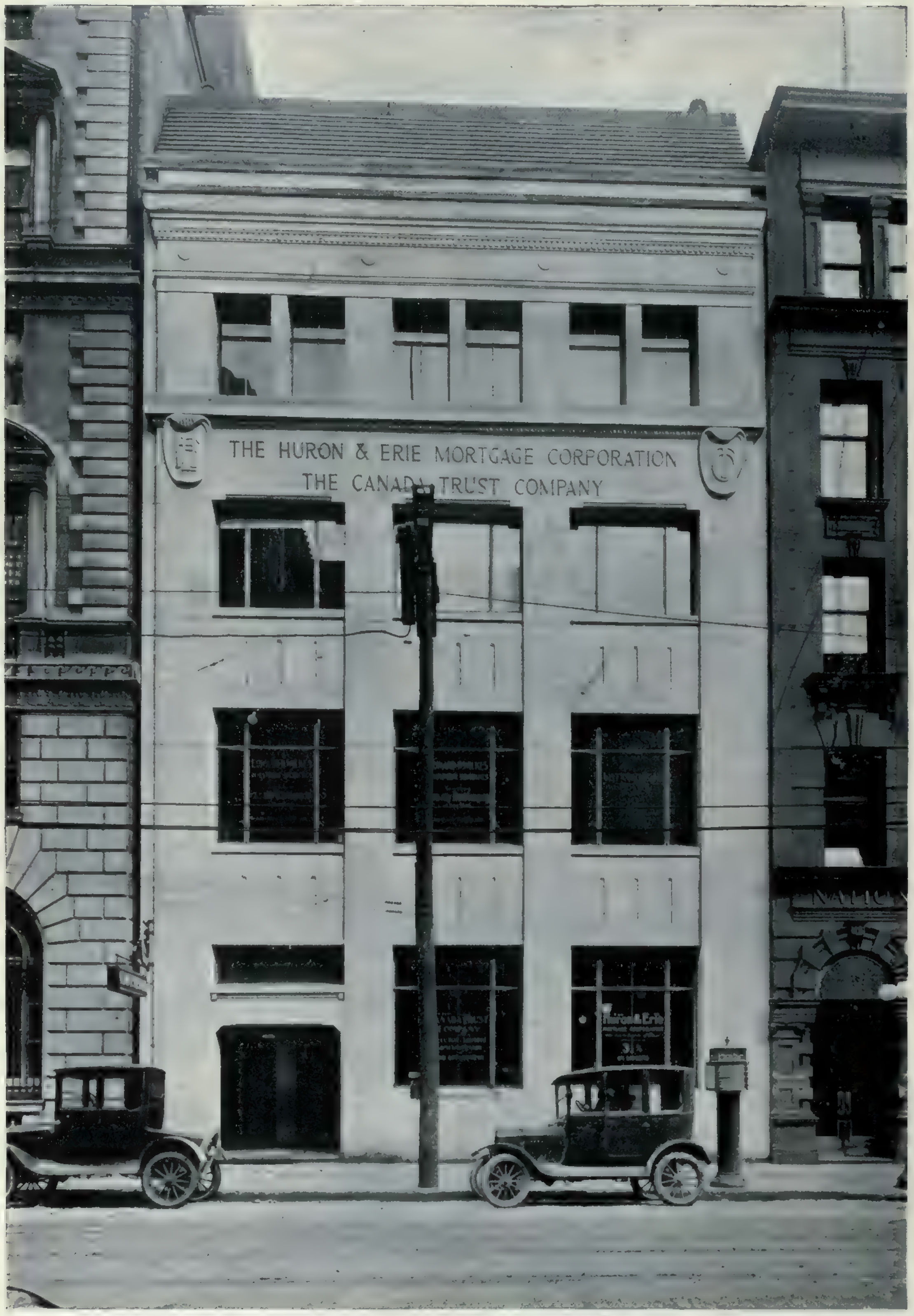
New Invention for Artificial Daylight

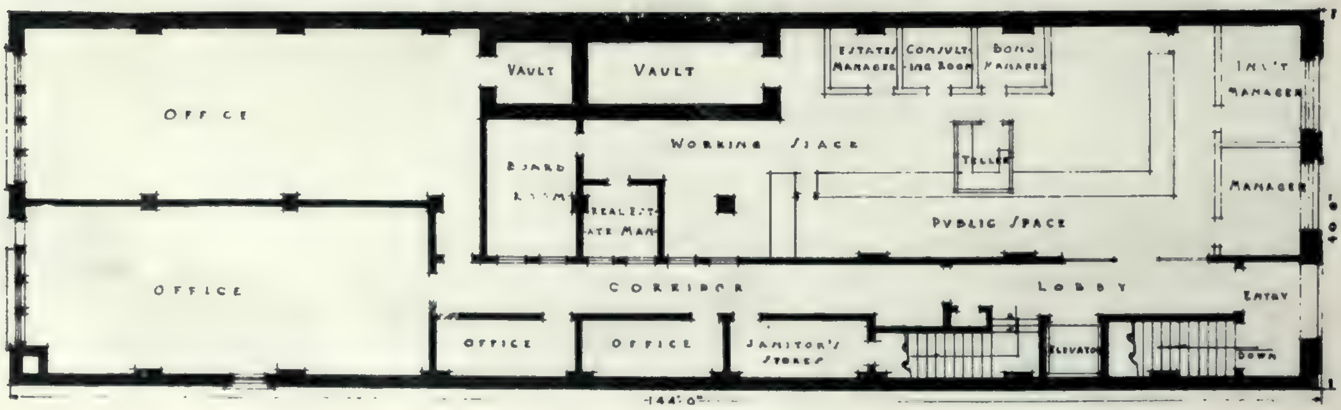
A light has been perfected in Great Britain which is understood far to surpass any existing arrangement of artificial light, and to be the closest approximation to actual daylight ever accomplished.

The apparatus consists of a high-power electric light bulb, fitted with a cup-shaped opaque reflector, the silvered inner side of which reflects the light against a parasol-shaped screen placed above the light. The screen is lined with small patches of different colors, arranged according to a formula worked out empirically by Mr. Sheringham, the inventor, and carefully tested and perfected in the optical engineering department of the Imperial College of Science and Technology.

ENTRANCE HALL: BANKERS' BOND BUILDING, TORONTO.

The light thrown down from the screen is said to show colors almost as well as in full daylight. A test was made with such articles as colored wools, Chinese enamels, pastels and color prints, each being subjected successively to daylight, ordinary electric light and the new Sheringham light. Under the new light delicate yellows were quite distinct, indigo bluse were blue, cobalts had their full value, and violets lost the reddish shade which they display in electric light.

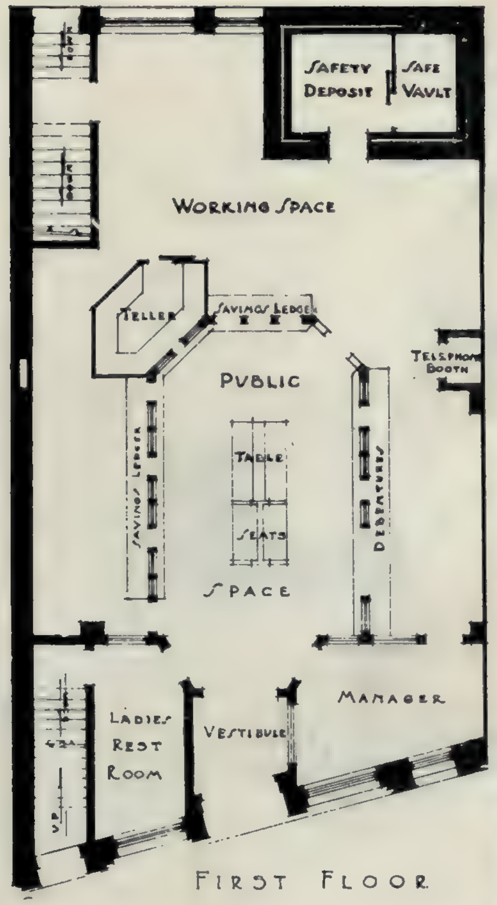


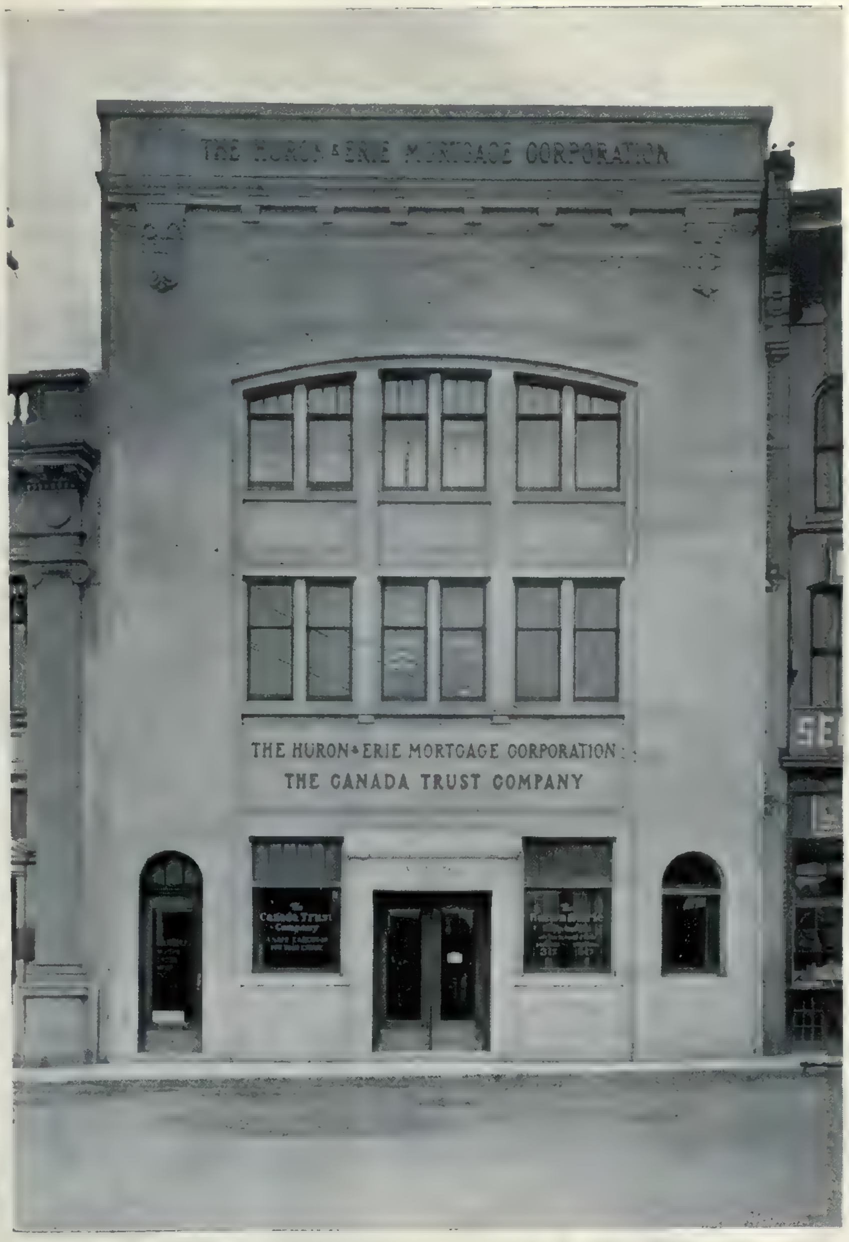


PLAN OF BANKING FLOOR.

CANADA TRUST BUILDING, TORONTO,

WATT & BLACKWELL, ARCHITECTS.




THE HURON & ERIE MORTGAGE CORPORATION
THE HURON & ERIE MORTGAGE CORPORATION
THE CANADA TRUST COMPANY

BUILDING OF
THE HURON & ERIE MORTGAGE CORPORATION
AND THE CANADA TRUST COMPANY,

MARKET BRANCH, LONDON, ONT.

WATT & BLACKWELL, ARCHITECTS.

Canada Trust Building, Toronto

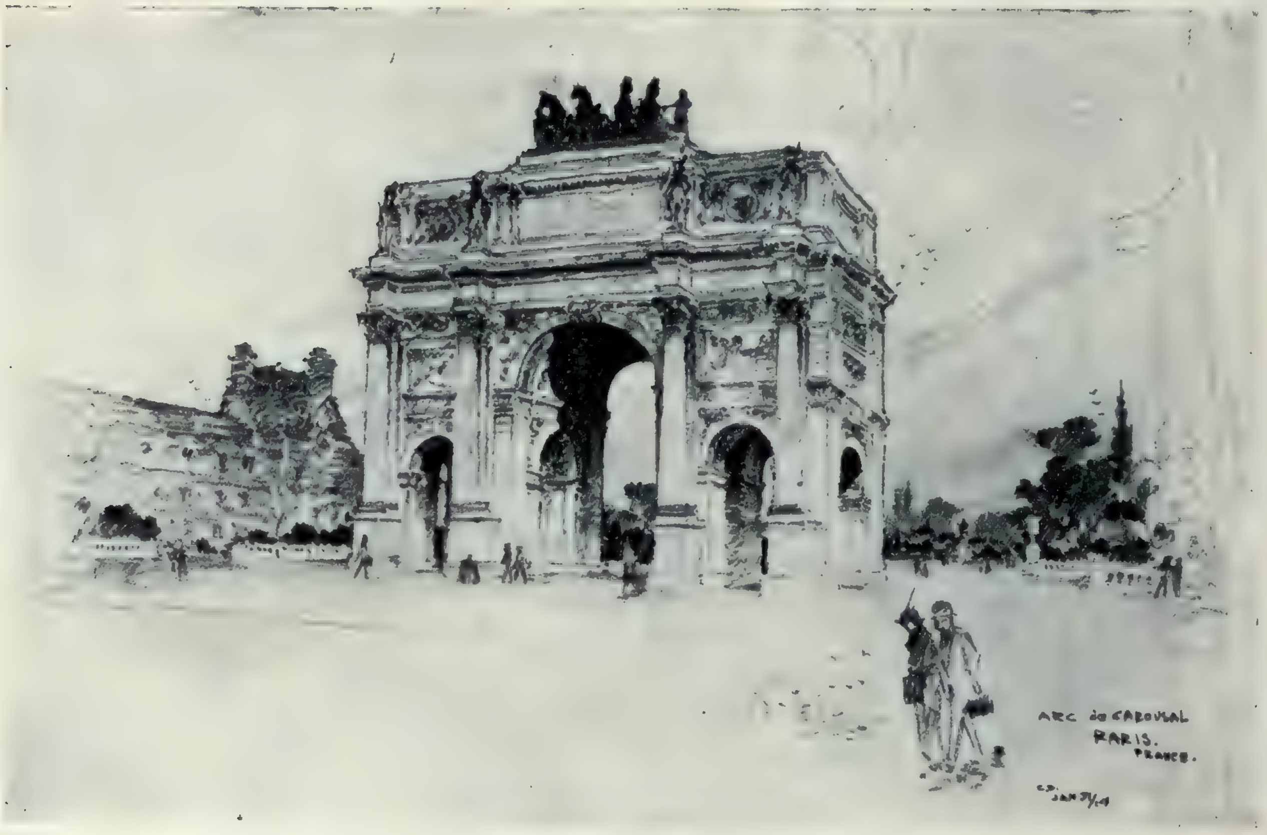
The building at 14 King East—now occupied by the Canada Trust Company and the Huron & Erie Mortgage Corporation, along with several other financial and allied institutions—was before alterations occupied by the Canadian General Electric Company, and on account of the many purposes for which it had been altered in previous years, it required considerable study to remodel same into a bank and office building to suit modern requirements.

The building being of considerable depth and closed in by structures on both sides, the first problem to solve was the locating of a light court in such a manner as to avoid lost floor space and yet retain the elevator in its present location, and also keep the vaults on the office floors over the banking vault, the position of which was fixed from the banking floor layout.

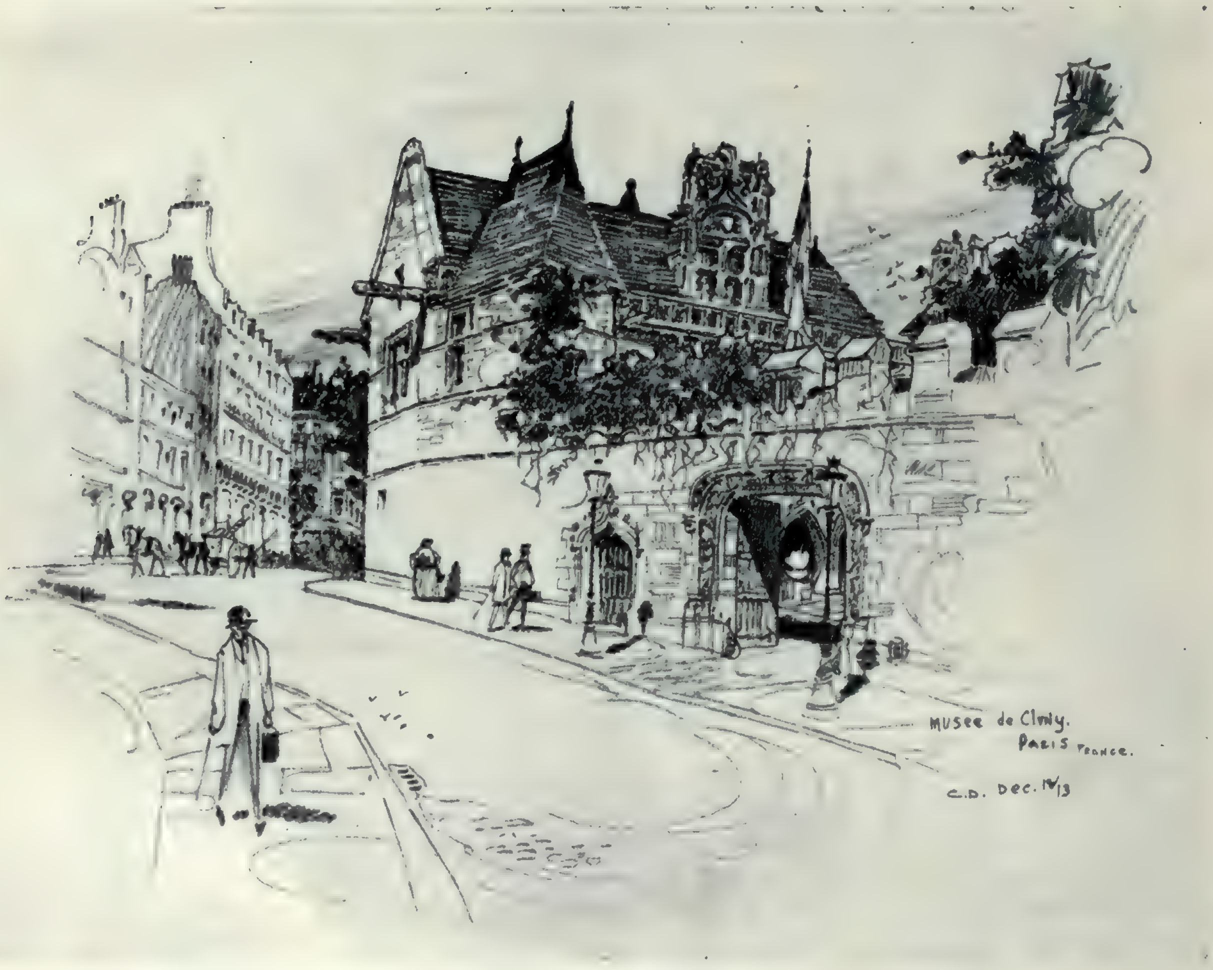
The above problems successfully solved, it remained for the architects to arrange a common entrance for both the cafeteria in basement and bank on first floor that would not interfere with either party, and on account of having to work to old framing and elevator enclosure, it required a great deal of study to overcome the difficulties encountered here.

The main entrance corridor is finished in Italian marble with marble floors and ornamental plaster ceiling, while the general scheme is carried through to the banking portion by having the counter front of the same marble, which is visible from the lobby through a glass screen that divides the bank from same.

(*Concluded on page* 134)



ARC DE CAROUSAL, PARIS.


MUSEE de Cluny.
PARIS FRANCE.
C.D. DEC. 14/13

MUSEE DE CLUNY, PARIS.

SKETCHES BY CHARLES DOLPHIN, ARCHITECT.

Leaves From An Architect's Sketch Book

By Charles Dolphin.

IN the concluding paragraph of the previous installment of this article a brief reference was made to London which, as explained then, is a study in itself. Hence I will not attempt anything further in the way of description here other than to say that for those who are fortunate enough to visit the Metropolis, it holds a multiplicity of interests, both architectural and otherwise. During the war it meant "Blighty" to all of the Empire's soldiers and the Mecca of "Leave of absence," and consequently many Canadians, including draftsmen, who saw overseas service, are well acquainted with its attractions.

LUXEMBOURG GARDENS, PARIS.

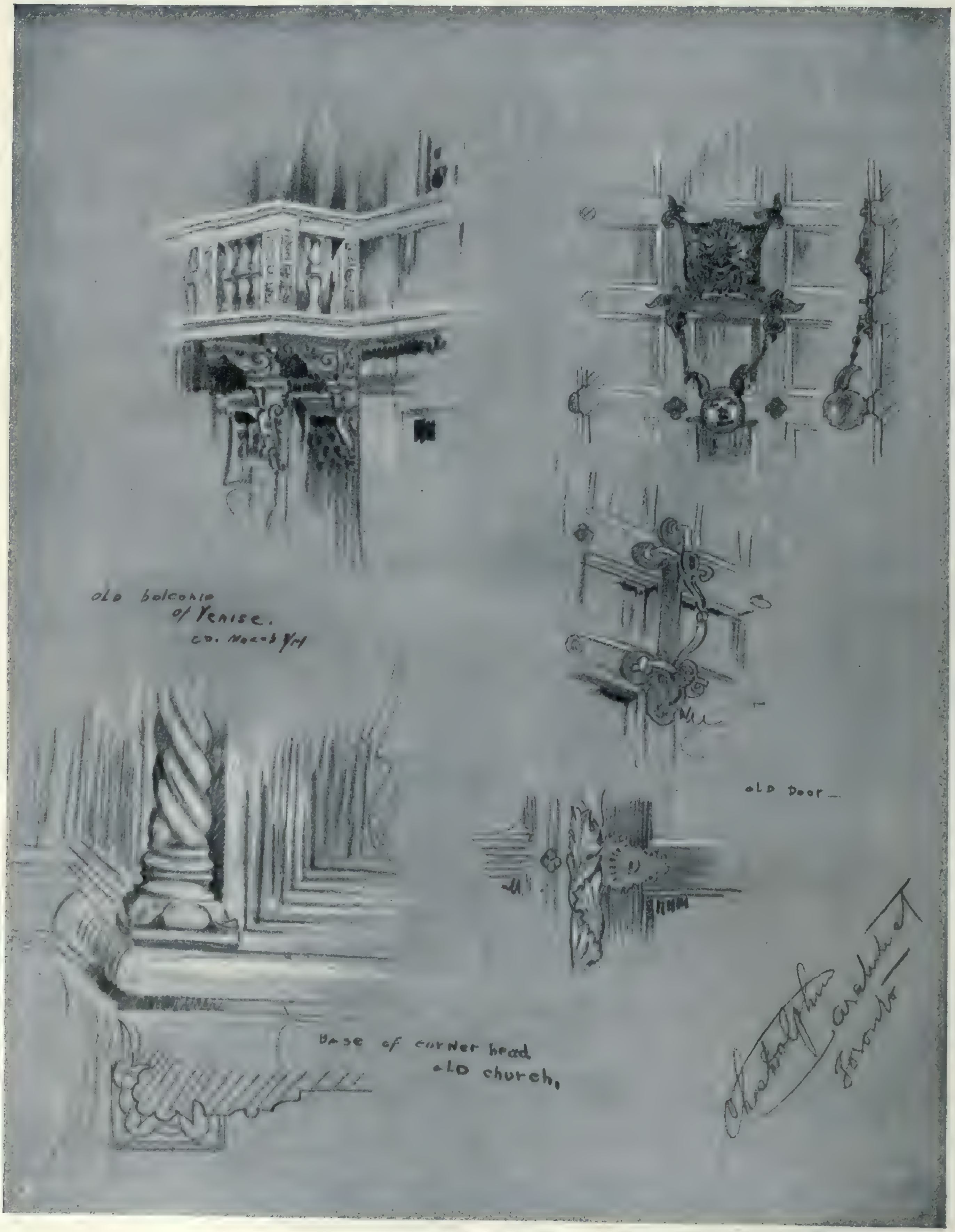
After three weeks' stay in London in 1913, we took the South-eastern and Chatham Express for Folkestone where we caught a channel steamer for Boulogne, the same steamer which, by the strange hand of fate, was consequently destined to convey my regiment, the 24th Battalion, to France on a summer's night in 1915. Little did I think on my first trip that I would see that boat again under such circumstances. Later in the summer of 1916 I watched the same town and docks come into view—this time from a hospital cot, but not the same ship. Folkestone seemed bent on impressing itself on my memory though I search it through and through in 1915 and found little of interest for architectural study.

On arriving at the French port we had to submit to the usual customs search for tobacco and matches, matches being a State controlled industry at the time. However, not being a smoker, they found none on me, although they did take a box away from a man nearby. It is merely one of the many little incidents differing from our own customs, which one encounters in European travel.

In passing it might be advisable to mention that a knowledge of the French language came in handy, and I was thankful for what little I knew, for it makes things easier in many ways when one possesses at least a smattering of the language of the country in which you happen to be travelling. Anyone contemplating a similar trip will do well to acquire as much French and Italian as possible before going abroad, for these two will take you anywhere on the continent, especially French.

Arriving in Paris we took a taxi (that was in the days before the H. C. of L) to the Hotel St. Petersburg, a small but very comfortable place. The student with limited means should guard against being inveighled into stopping at an ultra-expensive "caravansary" by a white-hatted brigand driving a Paris fiacre. Personally, I had not forgotten my Glasgow experience.

As a city Paris fastened its charm on us from the beginning. The effect at night on the boulevards, with all their pre-war smartness and brilliance, is something not soon to be forgotten. During our first evening stroll we were accosted by many peddlers offering various wares, the peddlers keeping one eye on us and at the same time exercising a sharp lookout for a chance gendarme, or Paris policeman, with his military cape and long sword hanging at his side. It has always been difficult for me to under-



DETAILS OF OLD VENETIAN BUILDINGS.

SKETCH BY CHARLES DOLPHIN, ARCHITECT.

stand the need for such a formidable part of his attire as this sword. I have never seen one used, although it is easy to imagine that it could do effective work. We were also accosted by a German who had lost his way, the first German I ever knew to get lost, except a couple of them who walked into a patrol of mine in No Man's Land during the war. They too were lost, but not for long.

To get back to the subject, the student visiting Paris will benefit by devoting a week to sight-seeing. This will enable him to get his bearings. One of the first things to do is to go to the top of the great Eiffel Tower with a map and try and familiarize oneself with the layout of the city's main boulevards. The view from the tower is unsurpassed. The tower being over 900 feet in height commands an uninterrupted view for miles in every direction, and the city is spread out like a beautiful picture. There has been talk of removing the tower, a claim being made in some quarters that it is out of proportion with all else around it. Personally, I think it would be a pity to remove it, though I do not anticipate Parisians asking my views in the matter.

The city itself is divided by the Seine, with a small island in the river known as the Isle de Cite, upon which is located the famous old Notre Dame. As we intended to spend the winter in Paris, we crossed to the Latin quarter side of the river, where we obtained rooms at a pension, which to our later disappointment we found was conducted by a party who had lived twenty-five years in the western State of Nebraska. This resulted in a loss of any respect I had for the romance of the place when I heard about it. I would advise selecting an abode with an old French family, and where they do not speak a word of English.

We did not, of course, have much time to do any atelier work, much less try for entry to the Ecole des Beaux Arts, so we located an atelier whose patron was a M. Hebard, and did what problems were then under way under his guidance. Personally, owing to the brevity of our stay, I feel that I received much more value from my sketching tours through the city and

CHATEAU PIERREFOND.

TOWER AND ENTRANCE GATE, CHATEAU PIERREFOND.

on little trips to nearby points not far from Paris.

My pension eventually proving unsatisfactory, I moved to a small hotel graced by the name of Hotel Foyot and rich in reminiscences of Whistler, Thackeray, Ruskin and many other men of fame who used to have dinners there in their early days. Another equally celebrated though less popular personage who patronized this place was the late Francis Josef of Austria, who used to stop there when a young man, no doubt looking France over at the time for future reference.

From my bedroom window I could look down upon the beautiful old Palais du Senat, once upon a time a place of royalty and a present to the Queen. Either the King belonged to the first camouflage corps or he loved the Queen a great deal, for the Palais and the Luxembourg Gardens in conjunction form a very beautiful setting.

Also from the self-same window I used to watch the artillery columns streaming by in seemingly endless procession at the dead of night. They seemed to be in campaign kit and off for manouvers, or was it another warning of the coming war. They always went north and few nights went by that a detachment of artillery or cavalry did not pass through my street. It may have been that these columns were just circling the neighborhood, which reminds one of the amusing strategy of a Canadian Colonel at the front during the war, when he had a prisoner placed before the window at headquarters and then ordered a company of infantry to keep circling the building until the poor prisoner thought about five divisions had passed on their way to the front. It was just one way of making the enemy believe that we had lots of reserves, which we did not. The night marching of these troops may, or may not, have had the same significance.

The travelling student should, of course, attend the free hand drawing classes at one of the many schools, as much as his time will permit. There are two well-known places of this kind at the upper end of Rue Notre Dame des Champs. These schools are Collorossi's and the Grande Chaumiere, and have been patronized by such men as Sargent, Whistler and other great artists.

Within easy reach of the city of Compiegne, with its palace, at the time we were there completely furnished as in Napoleon's time, but since ransacked by the Huns. There is a very fine little Gothic Hotel de Ville in Compiegne, and an interesting point about it to me is that, two years later at a Cadet school in France, which I attended while training for my commission as an officer, I was told by a room-mate, a former sergeant of the 16th Lancers (cavalry), Imperial Army, that he helped lock up about 200 Huns in that Hotel de Ville when the enemy retreated from the Marne.

A few miles from Compiegne is the great Chateau de Pierrefond, France's largest chateau, which was completely restored by Violet le Duc. It is without doubt one of the most imposing architectural piles imaginable and the effect when viewed from the railway station, with the chateau reflected on the little lake below, is very remarkable.

A curious coincidence about Pierreford is, that while there, and looking from the top of one of the towers, I happened to wonder what the country round about must have looked like in the war of 1870. Six months later the Huns were driving through the self-same valleys round about, on their way to Paris, and it so happened that I chanced to see a reproduction in the London Illustrated Daily News of a clipping from a German newspaper, showing Hun Infantry marching past the entrance gates of Pierrefond Chateau. With the exception of the troops, the Hun photo, and a sketch that I made six months before, were identical.

There are many other places also worth seeing, one of which, of course, is Versailles, and I would suggest that your visit be timed so as to be there on one of the days when the famous fountains are playing. These fountains do not play at all times, as I understand the amount of water required is too great to warrant continuous operation.

During the winter of 1913, it being fairly cold, I had the pleasure of skating upon the famous lake in the Park at Versailles, and being a Canadian I had my own skates, much to the disgust of French vendors, who rent them at the lakeside. There was a party of us, and as we approached I overheard one of the brigands say to the others, "Les Americains," (meaning "raise the price") but the consternation on their faces was funny when we hauled our skates from our overcoat pockets. I am sure we spoiled their whole day.

EIFFEL TOWER, PARIS.

St. Cloud, another interesting place, should be seen in the spring when all the flowers are in bloom, as its gardens are very wonderful. Also a trip should be taken to Fontainebleau Palace a few miles from the city. It is the self-

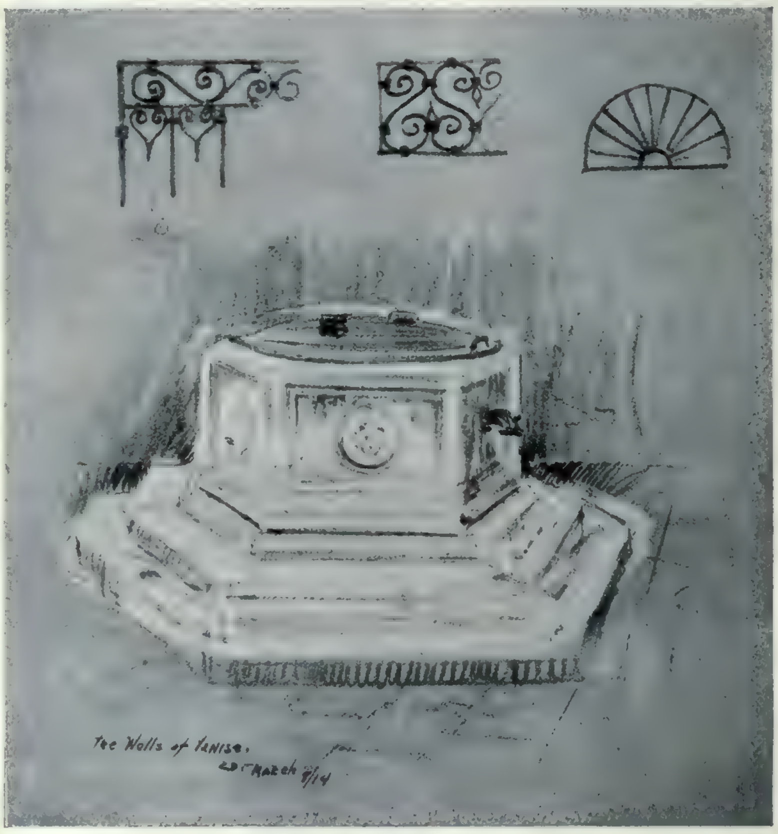
VENICE FROM THE ISLAND OF SAN GIORGO.

same palace where Napoleon kept the Pope a prisoner until he gave his consent to a divorce that the man from Corsica was particularly desirous of obtaining just at that time.

In the city there are, as before referred to, a great many points that will be a complete study in themselves for the student, such as Notre Dame Cathedral, Arc de Triomphe—through which the great Victory Parade passed at the conclusion of the great war—the Arc de Carrousal, etc.

As my itinerary was to include a tour of Italy and Greece, my first move was to buy a transportation ticket that would cover most of my trip from Paris through these countries and return. This method saves a lot of trouble on your journey. If you wish to take side trips from main points you can do so, but your main line of travel should be first taken care of and then it is off your mind.

I decided to go via Switzerland by the Simplon Tunnel route, as I wished to have at least a glimpse of the famous Alps. This route takes you round Lake Lucerne through Berne, Geneva, Lausanne and through the famous 12-mile Simplon Tunnel under the Alps to Milan, Italy.



ONE OF THE WELLS OF VENICE.

Entering Italy via this route gave me a lasting impression in that I came from the cool spring climate of the Alps to the sunny summer weather of Italy—it was like stepping through a door into the sunshine. The impression remained with me all the time I was in the south.

In Milan I stopped at the Hotel del Europe, quite a good hotel, and very near the famous cathedral, often referred to as a "Dream of Marble." An idea of the richness of the cathedral will be gained by the knowledge that there are over 2,000 lifesize statues scattered about its immense facades.

Milan is a very modern city in general appearance and a great centre of music. I mention this, as I was entertained each night by "singing bees" in the hotel courtyard by ambitious future opera singers at practice.

A trip should be taken out to Chertosa di Pavia to see the church with its famous Renaissance facade, and entrance gate with its "Sscraffeto" plaster work.

From Milan I then went to Verona to see the old

PORTA NUOVA, VERONA.

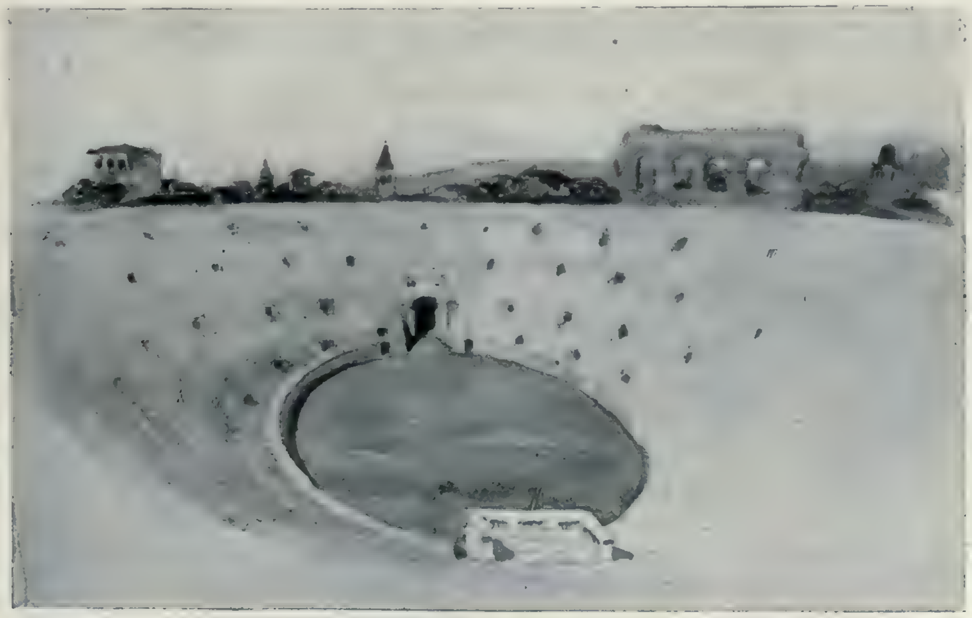
Roman arena, in very fine state of preservation and still in use for games, etc., and the beautiful Loggia facing the town Piazza. From Verona one may see the Alps that figured so prominently in the Great War.

I then proceeded to Venice, and if time allows, would advise a stop at Vicenzia, as there are many objects there of interest to the student.

Arriving at Venice is a very interesting moment of the journey, in that one travels at first over a viaduct well out to sea before reaching the city. On all sides, as the train speeds along, nothing can be seen but water with islands in the distance. Venice proper was built for protection from the northern tribes, upon islands well out at sea, and developed into, at the height of her prosperity, Mistress of the Sea. Her merchant palaces are one of the wonders of the world to-day.

Upon arriving in the city at night, I went out to the front of the station and was quite surprised to find nothing but water before me, and I realized that henceforth I must travel in a boat unless I walked, for there are no street vehicles of any kind in Venice except an odd hand cart, the streets being so narrow and continually crossing canals by countless, fine little bridges. It is without doubt one of the most

ARENA
AT VERONA.



SKETCHES BY
CHAS. DOLPHIN,
ARCHITECT.

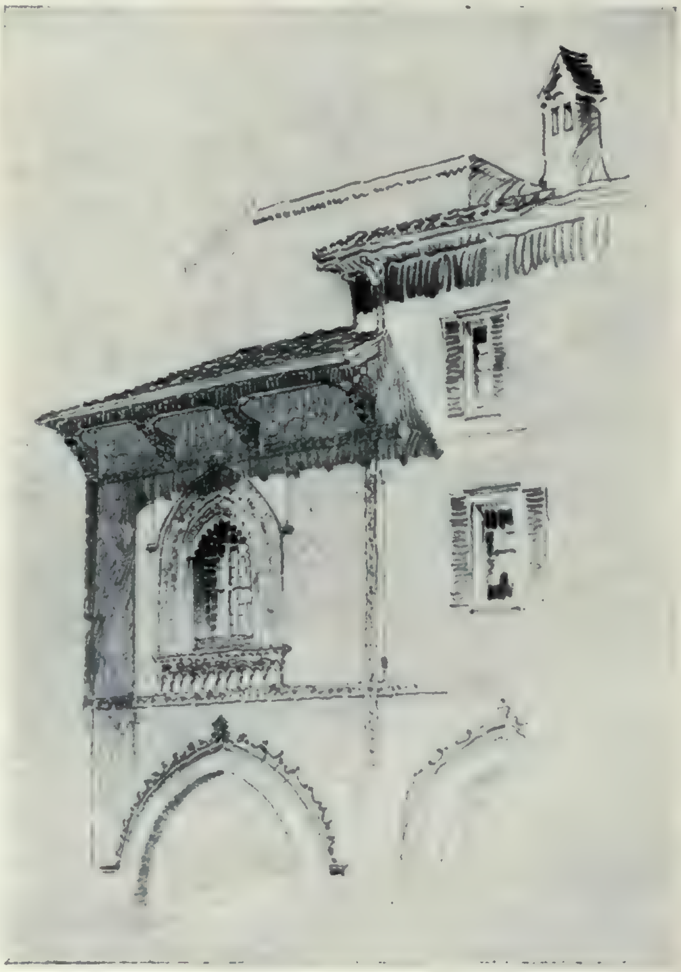
ARENA AT VERONA.

wonderful and entrancing cities in the world.

A complete description of the city is hardly possible, as there is so much of interest that I am constrained to leave it to the choice of the student to map out his own course throughout the city. Needless to say, that one may spend a month in Venice and then not weary of it.

It might be well to refer to a few of the important points that should, of course, be seen, such as the famous old St. Marks facing the Piazza San Marco, while around the piazza, or square as we would call it, will be found some of the finest buildings in the city, such as the Campanile, the Library and Doges Palace with its beautiful stairway in the court.

The Campanile fell a number of years ago, but a conscientious government placed barracades around the ruins and employed experts to sort out the beautiful carvings which were all carefully repaired, and the tower to-day is the result—practically the identical tower that fell. I understand that even the old brickwork itself was used as much as possible in its reconstruction. An interesting point is that the Pope at the time, who was a Venetian, had a telephone line kept open through to Rome at which end he listened to the bells as they rang again in the tower following its restoration.



PIAZZA DI MERCANTI, MILAN.

A trip across the lagoon should be taken to the Isola San Georgia from where a beautiful view of the city can be obtained. Also a trip to the famous recreation and bathing place, and if time will allow to the Cimitero (cemetery). This is also on an island by itself and is very interesting as many exquisite monuments and tombs are to be found there.

Throughout the city one will find a multitude of objects for study, especially the palaces along the Grand Canal, as well as innumerable little bridges spanning the smaller canals. Many beautiful balconies are to be seen and well worth study, as are also the Public Wells of exceptionally fine design, and it is well to remember that Venice is famous for its lace, glass and brass work, and many pleasant hours may be spent delving about among the many interesting little shops.

◆

Novel Overhead Crane

A new type of overhead crane, specially suited for long spans where rigidity and lightness are important and difficult to obtain with ordinary forms, has been constructed by a British firm of engineers. Instead of the usual double girder a single V-shaped girder is used. The hoisting ropes hang over the side of the girder, thus giving a higher lift than is possible with the standard arrangement where the hoisting ropes pass between the two girders. Other advantages are claimed for this interesting departure from traditional practice. It has been installed in the firm's own works with satisfactory results, the working load being 5 tons, the span 55 feet, the lifting speed 20 feet per minute, the traversing speed 120 feet per minute, and the main travelling motion 300 feet per minute.

Old Rails for a Coffer Dam

A novel method of constructing a coffer dam was employed by a British engineer in India when putting in the foundations for the abutment of a bridge. Piles were formed by joining old 20 feet double-headed rails head to head by iron bands. The lower ends were pointed and the piles driven at 61 feet distances. Mango plants were pushed behind the piles, and when bed-rock was reached, bags filled with clay were used to keep sand and water out of the dam. All the material used in construction was recovered after the work was completed, and the total cost was remarkably low.

◆

Vancouver permits up to April 1st total $878,593 as compared with $263,020 in the same period last year.

Memorial Windows

By Arthur S. Dixon, M.A.Oxon.

Reprinted from the Journal of the Royal Institute of British Architects.

I WISH to make it clear that I do not presume to speak about so intricate and technical a subject as stained glass, except, as it were, from the outside, as an architect may be allowed to speak. And the question which I propose to try to answer is: what the qualities or characteristics are whose presence or absence would lead us to feel that windows ought or ought not to be considered acceptable in churches.

This question is not a very easy one to answer, and I may perhaps approach it best if I ask the same question first of other things than windows. What, for instance, are the qualities which constitute the excellence of a church? This is an easier question, for a church has two very definite functions to perform, and it can be judged by its performance of them. First, it has the purely material or utilitarian function of providing shelter—*i.e.,* enclosing a space with four or more walls and putting a roof on top of them. This is sometimes a very simple problem in construction, and sometimes it becomes very complicated; but whatever the constructive problems may be, they must be solved in such a way that the composition of the lines and shapes to which they lead shall be harmonious and pleasant. The other great function of a church is the expression of ideas or feelings. The great west fronts of Amiens and Rheims are—or were—an ordered and logical expression in stone of the whole system of Christian doctrine and Christian ethics, as well as of the current science and day-by-day life of the time. The same is true of the sculpture at Chartres and Paris, and in lesser degree of the other great French churches of the 13th century, and of Wells and Exeter in England. The mosaics of the 4th to the 12th centuries in Rome and Ravenna and Venice, and the frescoes and wall paintings of the 13th, 14th, and 15th centuries in Italy, were expressive of the dominant religious ideas and feelings of their respective times. Incidentally, construction and expression resulted in work of such beauty as has long been beyond our attainment. But beauty seems to have been a secondary object, if, indeed, it was a conscious object at all. It seems to have been the inevitable result of well-directed energy and thought, which had for their primary objects material utility and spiritual expression.

It follows from this that when we judge or criticize a building we demand that the performance of its material or utilitarian function should be efficient; that the arrangement or composition of lines and shapes and colors by which this end is attained should be pleasant and harmonious. And in the matter of the expression of feelings and ideas I think that we demand that it should be clear and definite and in harmony with certain standards which we acknowledge of dignity and beauty. (I am not quite sure that the last point would be admitted by every school of thought to-day.) A picture has this in common with a building: that it is also a combination of lines and shapes and colors; but so also is a wall paper or a textile fabric. From a strictly etymological point of view, it might be called a picture or painting, if it were nothing more. But we should hardly call it a picture or think it justified as a picture if it did not convey to us a thought or an emotion. A landscape, for instance, is not a mere copy of certain existing facts which we call nature; it is rather a means of conveying from the mind of the painter to the mind of the spectator certain truths which the painter has perceived, or feelings which nature has aroused in his mind. A picture in which figures are employed will convey impressions which have been made on the painter's mind by his observation of human nature, or theories or doctrines which he embodies in human, or partly human, forms.

What then are the qualities which we demand in a picture? In the first place, a certain pleasantness or beauty, or, at least, a certain orderliness and dignity in the combination of lines and colors; and in the second place, the suggestion of certain ideas, facts, or feelings, which must be of a certain value or importance. Mr. Ruskin has said that a picture is not a great picture unless it either reveals a noble truth or arouses a noble emotion. All pictures need not be great pictures; but, at least, we demand of them that they convey to our minds some idea or some feeling which is of some value or interest.

A window can do all these things of which I have spoken in connection with pictures; but there are some things which a window can do and which a picture cannot do; and there are things which a picture can do much better than a window and which a window had better not attempt. A window is capable of much greater intensity of color than a picture; glass through which the light passes is capable of a fiery brilliance which cannot be attained on plaster or canvas or paper. This particular quality it must never forego; it must always look like glass, and it must always retain, at whatever loss of other qualities, that peculiar jewel-like quality which belongs to glass. On the other hand, there are certain things a picture can do much better than a window: such as effects of light and shade, and perspective and distance. These things a window had better not attempt, partly because it can never do them well, and partly because, if attempted, they would be likely to diminish the very qualities of brilliant color which are its especial glory.

A window differs from a picture in another way. A picture is not a necessity; we can, if necessary, do without pictures altogether, and therefore a picture, in order to justify its existence, must have something important to tell us. A window has a utilitarian necessity: we must have it to keep out the rain and the wind—it is justified if it does nothing more; and if the glass is colored, it is justified if the colors are so arranged as to give pleasure to our eyes. It may be nothing more than a pleasant arrangement of lines and colors, and still it is justified. But the designer of a window may, if he will, fill it with figures of men and women and saints and angels, and so make expression of thought and emotion; he may let the red and blue and green and golden light so shine through the glass as to quicken the hearts of worshippers and guide their intelligence. And so it follows that there are two main points by which a window may be judged—color and draughtsmanship.

Of course, there is no rule by which we can say whether the color of a window is good or bad. You may think the color of one beautiful, and I of another; there can be no proof which is right; all we can do is to train our judgment by continual observation of good examples, and all who have done so are agreed that much better coloring is found in old glass than in new. . . . . . I venture to say that anyone who is taking upon himself the responsibility of beautifying, or possibly degrading, one of our churches by the addition of a window should, if possible, spend some time in studying the examples of ancient glass at Gloucester or Malvern or Warwick or Oxford, or even, if he can find time to get there, as far off as York or Chartres or Bourges.

I shall, I am sure, be asked if it be true that the coloring of ancient windows is richer and more beautiful than that of our modern windows—what is the reason why this should be so. Was the ancient glass in itself better than ours? I would answer that 60 or 70 years ago, when the revival of painted or stained glass windows began, this was undoubtedly the case. There was only to be got at that time smooth, flat, very clear glass from which it was impossible to get the variety and richness of color and texture which marks the old windows. But since that time many varieties of glass have been introduced, and although the very skill with which modern glass is made has robbed it of certain qualities which made easier the task of the window painter, still there is now obtainable glass of admirable color and of great variety of thickness and texture; and we must, I think, admit that if ancient windows are as a rule better than modern windows the difference is due not so much to the quality of the materials we use as to the knowledge and skill with which they are manipulated.

The quality of color in a window does not depend entirely or even principally upon the quality of the color of individual pieces of glass. A single piece of color does not make its quality felt until it is seen in relation and in juxtaposition to other colors. The skilful arrangement of pieces of colored glass is more important in relation to the final effect than the quality of the color of individual pieces. You or I may get together a collection of the finest and most costly pigments in the world and put them together on a canvas, and the result might be some kind of a mess; it might not in the real, true sense be color at all. But let a Raphael put colors on a canvas, let his skilful hand arrange them in certain proportions and certain ways of juxtaposition which are revealed to his trained intelligence by intuition of laws which he himself perhaps only partly understands; then the colors begin to sing together, as the painters say, and for the first time you have what can really be called color.

I am not one of those who can even begin to explain the laws which govern the harmony of color. I suppose there are no colors which a great painter cannot mate together. A square foot of green and a square foot of red may be enemies for ever: but reduce the red to a square inch and the two may get on very well together. One tint of blue and one tint of red may clash: alter the strength of one or the other, and they may harmonize. An easier method, and one much used in mediæval times, was to separate colors by a neutral color or white or black. The brightest and even crudest vermilions and greens and blues are found in the coloring of our mediæval screens in Norfolk and Devonshire; they are separated from each other by lines of white or gold, and the result is soft and harmonious.

This method was embodied in the heraldic rule that color is never superimposed on color or metal on metal, but always color on metal or metal on color. Metal means gold and silver, and covers also white pigments instead of silver and sometimes yellow instead of gold. Black will also serve, and so will a neutral tint like brown or grey. In the roof of the sacristy at Sta. Croce at Florence the brown pine beams are partly colored: the brown of the timber separates and harmonizes the bright red and blue and green pigments. The glass of which a window is composed is self-colored; it is flashed with red and stained with green or blue or purple while it lies liquid in the furnace: but the drawing of outlines and of such elementary shading as is permissible in a window is done on the surface of the colored glass with a brown pigment, which is afterwards burnt in. The skilful use of this brown pigment is very useful in the harmonizing of colors, but nothing is more effective in this way than the black bands of lead with which the pieces of colored glass are held and bound together; and the thicker or wider the bands or cams of lead, the greater is their effect. In early times it was only possible to get glass in very small pieces; but this was often an advantage, for it increased the relative quantity of the harmonizing lines of black.

In the matter of draughtsmanship the difference between old and new is as great or greater. Many of our modern draughtsmen are very skilful; they may be even more learned in anatomy and perspective than their predecessors, more skilful in the matter of light and shade, more realistic in certain superficial ways, but these are things that do not really count in a window. What really counts after the mere color is the power of expressing feelings and emotions, and in these great qualities it is very seldom that the modern designer approaches the standard of the old one.

This is no matter for surprise, for it seems clear that each human faculty finds its highest development at different stages or epochs in the evolution of civilization, and when the age to which a certain art belongs is past and gone it would seem that we cannot expect an equal development of that art until the kaleidoscope of the world has been shaken up and a new age begins. We think of our own age as having begun some time during or after the dissolution of the Roman Empire. Sculpture and architecture had their highest development in the thirteenth, fourteenth, and fifteenth centuries; painting in the fourteenth and fifteenth; music in the seventeenth and eighteenth; literature, as some think, in the sixteenth; our own epoch is one of science and mechanics. The greatest intellectual power of our time appears to be directed towards science and mechanics, and this being so, it is not strange that we should not get at the same time the greatest success in any of the arts.

More important, perhaps, than the power of expression is the quality of the ideas and thoughts which we seek to express. On the mentality, if I may use so ugly a word, of a design depends its power to impress and touch our hearts, and the mentality of a design, if it is real, must always be the reflection of the mentality of the designer. Whatever is the quality of his mind will be the quality of his design. And here, I think, we fail very often, for our prevailing modern mentality seems to be rather shallow and sentimental and superficial.

I have been speaking in very general terms, and it is not easy in this way to make my meaning quite clear. I could make it much clearer if I could have obtained some colored photographic reproductions of windows; but such things are not yet, though I hope they soon will be, obtainable. Let me, however, try to deal with some specific examples.

The subject of the Crucifixion was used in the earlier times, in the thirteenth, fourteenth, and fifteenth centuries, as a symbol of one of the fundamental doctrines of Christianity: I mean the sacrifice and atonement of Christ and salvation by the precious blood. Later, and especially in Spain, it was used as a symbol of human suffering; or, if you like, of the splendid truth that the God we worship is one who shares our sufferings. But in the time of the Renaissance, in the sixteenth century, the same subject was used as a vehicle for the exhibition of anatomical knowledge, and examples are not uncommon in which little expression remains of any definite feeling or doctrine whatever.

The symbol of the doctrine of the Incarnation, the Blessed Virgin and her Child, was used in earlier times principally for the purpose of illustrating and inculcating the doctrine of the Incarnation; the Renaissance painters and sculptors seem to have forgotten its original intention and to have used it as a symbol of human and maternal love.

Many doctrinal subjects, such as that of the Last Judgment, have almost ceased in our times to be represented in the arts. Mediæval churches were crowded with figures of apostles and prophets which were always used with real and living significance; with martyrs whose splendid, and one might almost say fortunate, deaths were vividly realized; with saints whose continued and living influence on the spiritual fortunes of men were fervently believed. I shall not, I think, be contradicted if I say that for us when we use their memories for the decoration of our churches they have nearly, if not quite, lost their vital significance.

The point is that we want more definite intention and clearer reality in our modern work; we ought not to use any subject or any figure unless we use it to represent some idea or feeling which is really vital to us. For this reason, I think we must welcome any attempt to use subjects such as those which are connected with the late war. They make a real and direct appeal to us at the present time, and they will be an historical record for future generations of considerable interest and value. But the representation of such subjects involves great difficulties; we have no well-tried tradition to assist us in the treatment of modern costume, and we must be very careful to avoid over-realistic treatment on the one hand and the prevailing tendency to sentimentality on the other.

I do not know whether I ought to use such words as "sentimental" and "realistic," for they are words of rather vague and uncertain meaning. I must, at any rate, try to explain what I mean by them. I find I have used the word "real" in two different and, indeed, opposite senses; in one sense we want more of it, and in another less. We want more reality in thought and less realism on the surface. When we try to express a thought or feeling we ought to make quite sure that it is a real thought or feeling of our own, and not one which we have taken or copied second-hand, and without full understanding, from someone else. But we need not be too careful as to exact correspondence with fact if it interferes with or actually diminishes the especial clear or transparent quality of the glass itself.

Reality of thought. Let me try to probe this a little deeper. I once lost my pocket book in a wood in Switzerland, and coming back to the hotel I told the patrona of my loss. "Why do you not ask St. Anthony to find it?" "I should not like to trouble a great Saint with my little losses—I should not think it respectful." "Do you not know his story? He lived in Padua in the thirteenth century. He spent his life in tending and comforting little children. When he died he found himself without the great happiness of his life and it was arranged for him that he should find for people things they had lost; they should put 50 centimes in the little trunk by the plaster images of the saint which you so often see in our houses, and these thank-offerings shall be given to homeless children. He likes you to ask him for help."

My pocket book was found by another guest in the hotel who wished me to know his name was Antonio. To these people St. Anthony is a real living personality; that is why they like to dedicate churches to his name and to see his image in their churches and their homes. This is reality of thought.

So it is with another saint—St. Joseph—whose cult is so widespread in modern times. They believe he is a living personality, always near and ready to help them in their troubles and difficulties. These instincts and feelings are somtimes trivial and they may be partly superstitious, or there may be reality at the back of them, but the people's thoughts about them are certainly real.

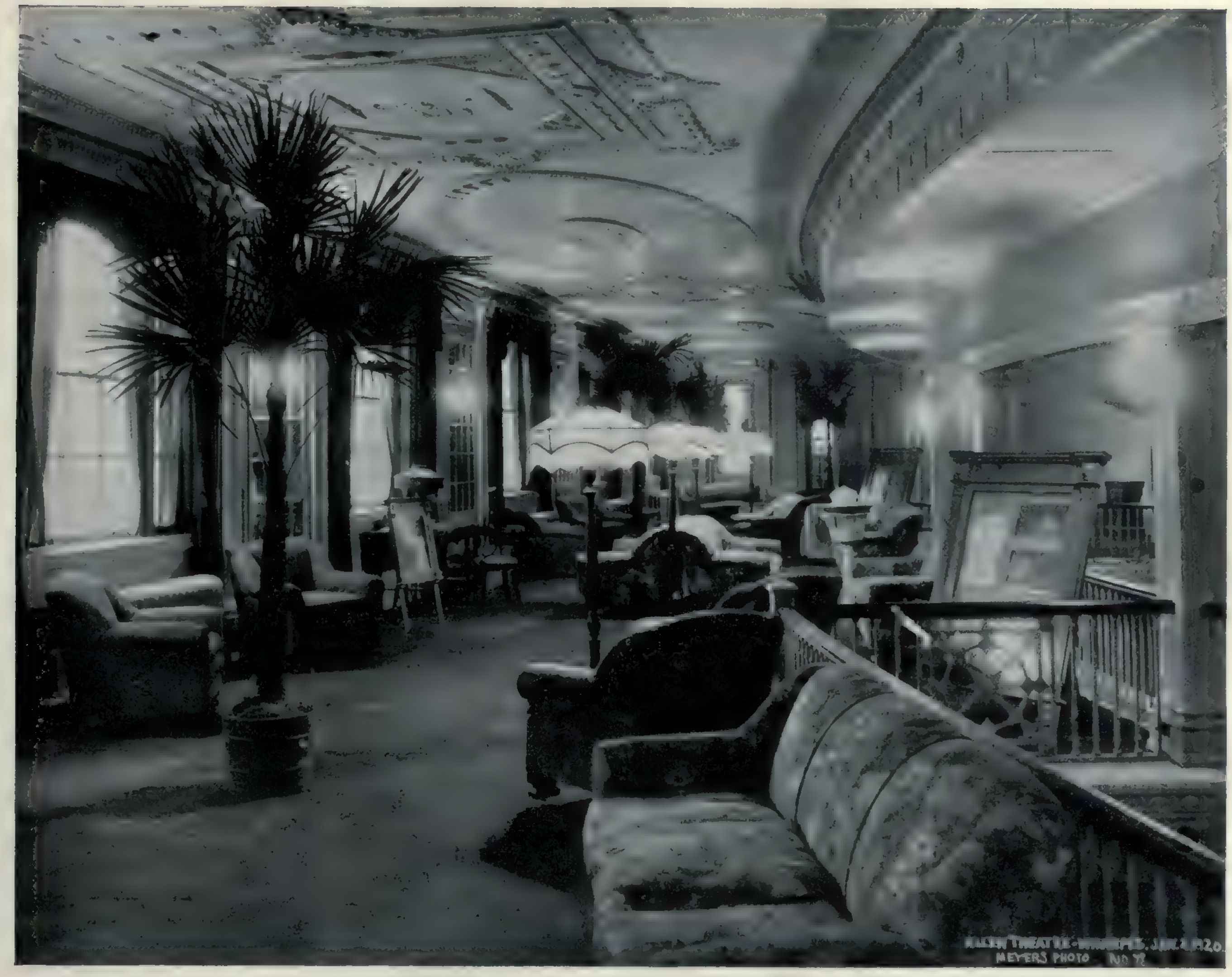
We, on the other hand, when we dedicate our churches or choose the subjects for our windows, how do we make our choice? We do not know very much about, shall we say, St. Jude or St. Matthias, but we have already in the town a church dedicated to St. Paul and St. Peter. We have already a figure of St. John and St. Luke in that other window, and we had better not go outside the New Testament; so we choose St. Jude or St. Matthias; but is there any living reality in our feeling about them?

Sentimentality is much the same word in its origin as emotion or feeling; emotion and feeling of the right sort are the last things we want to get rid of. I am not sure if there is any emotion which can be called in itself essentially sentimental; but I conceive that a strong and noble emotion can easily become sentimental in the manner of its expression. It may become sentimental if it is exaggerated, or if it lack restraint and become hysterical. There is, also, a difference between different kinds of emotion; some are profound, some superficial; some are lasting or permanent; some are fleeting and they soon pass away; and the latter when expressed in permanent form become a source of weariness and irritation.

I do not think you could ever find anything you could call sentimental in ancient windows. You might at first sight think the old glass painters' figures deficient in expression, but on closer examination I think we must admit—and this more particularly applies to the earlier thirteenth and fourteenth century windows—that there is a very remarkable strength of expression in the lineaments of their faces and in the pose of their figures. The longer we look at them the more we must be impressed with the depth of sober feeling they manage to get out of their simple lines and touches. Every face and every figure seem to have a different and interesting and important thing to tell us.

Another fault they always manage to avoid is any appearance of self-consciousness in their figures; their figures never look as if they were sitting for their portraits. Our modern figures more often than not look as if they were having their photographs taken. I fancy the reason is the direct use of models; it would be safer perhaps if our modern designers did not use a model for any particular figure they are designing, if they did not draw their designs directly from the model. Of course, a designer must train himself in the knowledge of the human face and figure by long courses of drawing from models. But the actual figure in the window should come, I believe, from images formed in his own mind by the action of present thought on the garnered treasures of past experience and observation, rather than from a model posed and chosen for the particular purpose of the design in the actual making.

(*Concluded on page* 124.)



MEZZANINE PROMENADE: ALLEN THEATRE, WINNIPEG. C. HOWARD CRANE, ARCHITECT.

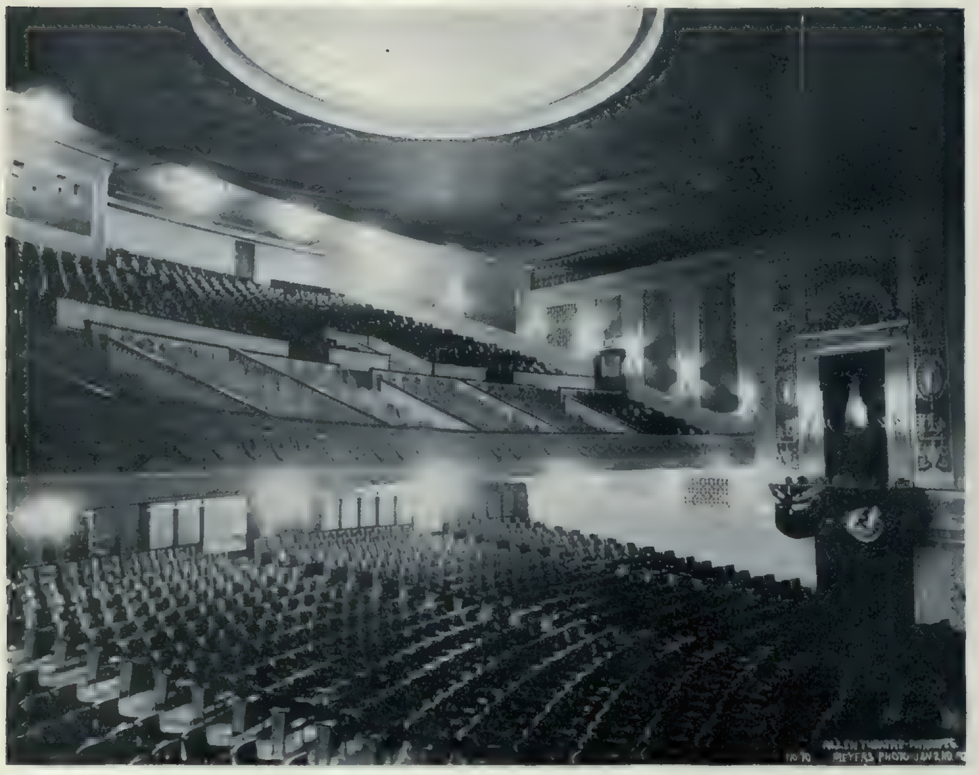
New Allen Theatre, Winnipeg

WHILE the growth of moving picture houses represents an outstanding phase of present building development, this growth in itself is secondary in importance to the deservedly noteworthy type of structures which are being erected. The Allens in particular, have done much to promote good architecture in buildings for this purpose as has already been demonstrated by subjects presented in these columns, and their new Winnipeg house, recently opened, and which is illustrated in this connection, is but further evidence of their progressive policy.

This new theatre is not only the latest, but it is the largest photo-play house on the Allen circuit. It rivals in decorative character and appointments its several worthy predecessors which have been added during the past few years to the large number of similar enterprises all under the control and direction of the one management. The exterior, which is of buff brick, and which shows a nice use of stone ornaments, is somewhat in character with the down town Toronto theatre, owned by the same interests. Stores for rental purposes are on either side of the entrance, with circular headed window openings in the upper facade and shallow pilasters rising to a simple detail cornice.

The plan itself embodies no unusual departure as regards layout or arrangement. Access is through an attractive lobby, 20 by 45 feet, connected with a 10-foot foyer, extending the full width of the auditorium. The outstanding feature of the interior is a luxuriously furnished promenade on the mezzanine floor which with its heavily upholstered chairs, settees and reading lamps, and richly carpeted floor, makes an ideal meeting and resting place for the patrons, with every comfort and convenience.

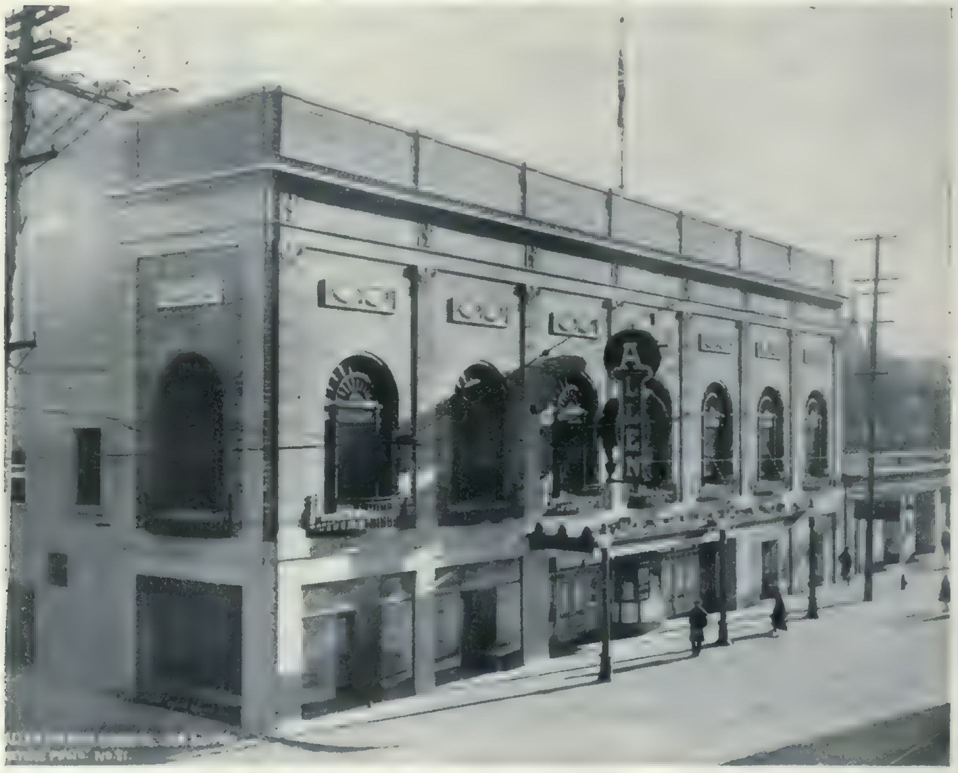
The auditorium is circular in form, free from columns and obstructions, with a large balcony having the front portion taken up with boxes or reserved seat compartments. The seating capacity of the house is 2,000. As in most of the theatres erected by these interests, the orchestral pit has been eliminated and the musicians occupy a slightly elevated platform which



AUDITORIUM: ALLEN THEATRE, WINNIPEG.

brings brings them in full view of the audience.

The color scheme and decorative detail show skilful handling throughout; old rose, ivory and French gray tones predominate, with fluted columns and plaster ornament forming the definition of the wall panels. An elaborately designed dome with hidden electrical effects recessed in coves, enables the house to be lighted without any bulbs being seen. Comfort at any season is assured through the installation of a most modern ventilating system costing in itself $52,000.



ALLEN THEATRE, WINNIPEG.

In the heating plant an oil burning system has been substituted for the usual coal consuming furnaces, and gives entire satisfaction. This is said to be the first theatre in Canada to adopt this method of heating.

The Regina house, which is also illustrated, is a smaller theatre, seating 1,000, and is carried out in equally good taste and modernly equipped.

The Allens have now forty-seven photo-play houses under their control and direction, with twelve more in other principal cities now under construction. Similar theatres to the one at Winnipeg are to be opened in the near future at Vancouver and Calgary.

Memorial Windows

(Continued from page 122.)

I think we have now come across one or two points which ought to be some guidance to us in the selection of designers for our church windows. In the matter of color and other questions of technique, such as the selection of glass and the manner of the leading, the colored sketches which are generally submitted are little or not use as a guide. It is impossible to tell from them what a window will be like in these respects. We ought, therefore, as a general rule to make a point of going to see some of the work already executed by the designer to whom we are inclined. I say "as a general rule" because if we made the rule too strict a new designer would never get the chance to make a beginning.

In the matter of expression the case is different; the original sketch generally gives a very good idea of the mentality of the designer. If his way of thought is weak or sentimental or superficial we can detect it at once just as we can recognize in the original sketch his power of drawing or the virility of his mind. I venture to say we ought to make up our minds to take trouble to spend time in selecting designers whose work will give dignity to the church, instruction to the people, and real assistance to devotion.

Then there is the question of cost. A painted window used to cost, before the war, from £2 10s. to £4 a square foot. Now they seem to cost about double. And I hear people say, "So and so's window may be better, but we cannot afford it." Well, there is an easy way out of this difficulty. You need not fill the whole window with colored glass. There are some very fine windows, both old and modern, in which a large proportion of the glass, perhaps as much as two-thirds, is left plain and white. In this way it is clear that the cost may be reduced from, say, £6 to about £2 10s., or from £8 to £3 or thereabouts per foot. It is much better to have a window one-third of which is good than one of which no part is good; and the plain white glass makes a very good and effective foil or set-off for the little piece or pieces of color.

ENTRANCE LOBBY: ALLEN THEATRE, WINNIPEG.

Another way of reducing cost is to do away with figures or drawing altogether, and to be content with a mere arrangement in skilfully designed leading of pieces of colored glass. There are many cases in ancient churches of old glass collected from broken-up windows and reset as a mere pattern of kaleidoscopic color. The same kind of thing can be done, and has been done, with new glass with excellent effect, and I suppose that even now such a window need not cost more than 30s. a foot. Such a window would not be considered suitable for a memorial, but it would be quite possible to insert in a window consisting principally of a pattern of tinted glass one or more small figures or medallions, and in this way also cost may be considerably reduced. . . .

I think the first step is to get clear in our minds what are the qualities we can get and ought to want in a window, and what are those which we cannot get and ought not to want, and to ask our designers for the former, and not for the latter. . . . We ought to realize that glass painting is one of the greatest and noblest of the arts, and we ought not to be satisfied to lag too far behind the steps of our own great masters.

The Best Sort of Client

One frequently hears, states "The Architect" (London), discussions among architects as to their clients, and sometimes those which take place among clients as to their architects. The employer and the employed naturally take individual standpoints, but from many criticisms it may be possible to arrive at some general conclusions.

To start with, an architect's client, while not possessing the wealth of Monte Cristo, should certainly have enough money to pay for what he wants without undue strain, for the architect who tries to obtain a quart of requirements within a pint measure is doomed to disappointment and difficulty. At the same time it is by no means certain that a client whose wealth exceeds the utmost dream of avarice is an easy client to deal with, for, as we may have too much of a good thing, there is such a thing as an actual *embarrass de richesse*. But architects and clients both vary, and the best client for one

ALLEN THEATRE, REGINA, SASK.

architect is not necessarily the best client for another. Some of us can place ourselves without much difficulty in the position of our clients, and others cannot. For the first class of architects it is better to have a client who does not define his views and wishes with absolute precision and finality, while another architect will do his best work within narrower limits. In a word, if a man has imagination and insight his best work will be the result of being given a free hand, while other good architects may actually do their best work in giving shape and form to definite conditions laid down by their clients.

◆

B.C. Employees' Housing Scheme

A recent issue of the Labour Gazette reports that the housing plan of the Office Employees' Association of the British Columbia Electric Railway, has so far proved so successful that forty officials of the company have taken advantage of it to acquire homes, and that other large business firms of Vancouver are considering the adoption of similar schemes. A loan of $75,000 was made to the Association by the company when the scheme was first adopted last April. Any office employee of the company may borrow from this fund either to pay off a mortgage, or to purchase or build a house. The borrower is required to make a deposit of about ten per cent. of the loan, but smaller amounts are taken. A monthly rental of slightly more than one per cent. of the loan is charged for twelve years, and is deducted from the pay roll. After this period the borrower owns his own home. In the meantime all taxes and water rates, and insurance premiums, are paid by the Association. Repayments on the loans are used to make further loans.

◆

Big English Housing Scheme

According to a recent news item, work has been started on a housing scheme at Tilbury, England, which will involve the erection of 1,520 dwellings and necessitate an expenditure of £1,500,000. The project is being carried out for the benefit of the transport workers at the docks, and the houses will be grouped about a triangular central park, and be equipped with baths and all modern appliances.

AUDITORIUM: ALLEN THEATRE, REGINA, SASK.

Co-operation Encouraged by Fixed Fee Plan*

By F. A. Wells.

IS the general contractor to remain a constructive force in the building industry? We would hardly be attending this meeting were we not certain that the general contractor renders a needed service to owner, to architect and to engineer. Certainty of delivery within the set time, reasonableness of the cost of construction, and the carrying out of plans and specifications without undue difficulty to owner or architect in getting that compliance, are dependent upon the existence of concerns such as are represented in the memberships of this association.

Yet there are certain individuals who see this matter differently, and who, noting certain things wrong, believe that the remedy is to be found in the elimination of the general contractor, and the assumption of his duties by the architect. What are some of the difficulties and what is the true answer? A well-known middle west architect recently stated one side of the question in a letter to an architectural paper. That letter is significant to the members of this association as outlining a definite effort being made to get work done without a general contractor. It started with the right premises. I do not feel, however, that we as an organization or as individuals can agree with the conclusion. He says:

"Curiously enough, the architect has little or no direct dealings with the craftsman who executes his designs and the worst of it is that the head contractor is placed in a position in relation to the architect that is the very opposite of what it should be to secure the ideal results for architecture.

"Our system of letting work by competitive bidding and then placing the contractor in a position where his profit depends largely on doing as little as the contract will allow for the final execution of the work is a vicious system which has always resulted in making impossible that sympathetic co-operation between architect, master builder and craftsman, which must exist in order to secure the best results in the work."

I think little explanation of this statement is necessary. We all know it to be true. It is a clear portrayal of the situation under the lump-sum contract. Regardless of the builder's ability, the amount remaining for profit is little or much, precisely according as the builder is fair or unfair, generous or tight in his interpretation of specifications. But what is the answer? The author quoted has one idea and we have another. This architect goes on to say:

"An architectural firm with an architect at the head, a master builder and all of his assistants, including a competent force of skilled craftsmen to carry out sympathetically all of the details of the work, would make an organization which it must be admitted, would undoubtedly be far superior in every way to the organization it is at present necessary to gather together for every architectural problem undertaken."

FIXED-FEE CONTRACT BETTER SOLUTION.

I submit that the fixed-fee contract is a better solution of the problem. It requires that a reasonable fee be paid for a definite service.

Some architects may handle their client's work through letting all operations to sub-contractors and may accomplish a good result, but there is no inherent necessity for the architect to broaden his scope. If he desires to increase his opportunity of making profit by extending his activities into the construction field, it is unquestionably permissible, but to do so, he must build a special construction organization able to do just what the general contractor now does, and candidly, most architects would prefer not to be responsible for the larger organization with its certain heavy overhead. In our judgment, after forty years' experience with the various forms of building contracts, the cost-plus-fixed-fee contract, when made with a builder of integrity and ability, brings all that a fair-minded owner can expect or want.

Ability to co-ordinate work is fundamental to economy. It is second nature to the general contractor. While men available to the general contractor are also available to the architectural firm, yet certain jobs going forward to-day where the architect handles all the work through sub-contracts, show very conclusively the lack of that co-ordination.

ECONOMY DEPENDENT UPON CO-ORDINATION.

Co-ordination means economy, and is dependent upon the absolute dovetailing of all trades represented with each other and particularly with the main structural elements. The framework could be built at least cost if no cognizance were taken of other trades. If that work is let as a separate contract, there will be little sympathy on the part of the builder with delays occasioned by or to other trades. Such delays will be the basis for extras. The better way is to have the structural frame handled by the same organization responsible for the general co-ordination of all work. Therefore, the architectural firm handling construction should do exactly what the general contractor now does, but, as a matter of fact, architectural firms do not, except in rare cases, retain any part of the work for their own construction forces to handle. Therefore, such architect's service does not parallel the operations of the general contractor who does from 40 to 60 per cent. of the work with his own organization and equipment.

---

* Paper presented before the recent National Conference on Construction of the Associated General Contractors of America.

But how will this contract meet our critic's objections? He wants the builder to operate with, instead of against the architect. On the lump-sum basis, there is a premium placed upon skinning the job and the multiplying of controverted interpretations of plans and specifications. Remove the premium and the difficulty disappears. The fixed-fee contract does it!

The ideal result for architecture consists in obtaining the best possible building at the lowest cost compatible with a reasonable time for execution. Now the best possible building is not reasonably to be expected where the builder can increase his profit by the amount of every omission of undetected substitution, nor will there be a fine execution of the work where every minor opportunity for betterment of plans, and, in fact, every necessity for change from original layout offers opportunity for extras on which few contractors have ever been known to suffer a loss. Under the fixed-fee plan it is possible to order changes, great or small, with absolute knowledge that the cost will be fair and often without increasing the amount of the fee.

FIXED-FEE PLAN FOSTERS CO-OPERATION.

Unquestionably the lump-sum system has many faults. It often gives opportunity for arbitrary and unfair rulings against the contractor, in favor of the owner. It kills that sympathetic co-operation between architect, master builder, craftsmen and owner, which should exist if the owner is to secure the best results. To revive that co-operation, we need only to adopt the fixed-fee principle.

Let me quote from another well-known architect, writing also in the architectural press and answering a question propounded to the membership of the Illinois Society of Architects, which was "Can construction costs be lowered?" We are all interested in its solution. He says:

"On first reading, I was inclined to say that it cannot be done, but one method occurs to me. The idea I had concerns the letting of contracts. There are two methods: first, letting separate contracts for each branch of the work on a unit price basis. Second, letting a general contract for the entire work on the cost-plus-percentage basis. The latter method is the one I suggest.

"The question is largely one of buying power. The general contractor can buy and sublet so much cheaper than the architect that he saves not only his own percentage but in most cases considerably more. The organized contractor's buying power is based on the same qualification as that of any business man who goes into the market to buy goods. He knows values and he knows the market.

"There is still another advantage. The element of divided interest is eliminated. The relation of the owner, contractor and architect becomes one of co-operation solely, each striving for the best results at minimum cost."

Thus we have heard from two architects. There is between them no middle ground. With the premises of the former we may agree, and with both the premises and conclusions of the latter we do agree.

Some of our members are strong partisans still of the lump-sum contract and desire the fixed-fee contract to be dropped. I believe, however, that under to-day's conditions the consensus of opinion of this organization, as well as of most owners, architects and engineers, is that the fixed-fee form of contract is wise and necessary.

UNSETTLED CONDITIONS IMPORTANT FACTOR.

The case might be different if we knew what carpenter labor would cost six weeks from to-day, or whether cabinet work included in the contract will be delivered at an estimated figure or at a considerably increased cost due to the great difficulty in securing materials.

I believe these conditions are sufficient reason for the adoption of the cost-plus-fixed-fee contract by builders, for its approval by architects and engineers and for its acceptance by owners who are fair enough to expect to pay what their buildings really cost under capable and trustworthy management. We can do our utmost to safeguard an owner against undue cost, but it is not our province to guarantee a cost unless we wish to enter into competition with Lloyd's. On the other hand, were the market falling, surely the owner would desire the advantage of possible lower costs.

The cost-plus-fixed-fee contract is just because it is as adaptable to smaller sized jobs as to the largest construction work and the smaller contractors who are honest and capable can do work on this basis as readily as the larger contractors.

ALL GAIN UNDER FIXED-FEE CONTRACT.

To me the vital necessity to-day is for this association to get behind the cost-plus-fixed-fee contract for building construction. The general contractors cannot lose by its adoption—they have much to gain; architects and engineers have much to gain, and owners have much to gain, for neither the owner nor his architect and engineer desires the cheapest building it is possible for a builder to erect under the plans and specifications, yet that is exactly what he gets under the lump-sum contract. There can be no such thing as complete specifications. A lump-sum contract is a standing invitation to a builder to skimp the work just as far as he can get away with it.

Of course, a reliable contractor, jealous of his reputation, will not intentionally be unfair, and yet he is not able to look at a problem wholly from the standpoint of the owner if such an attitude jeopardizes his profit. Details not specifically covered in plans and specifications are frequently essential to the success of a building and the builder is not able, under a lump-sum contract, both to conserve his own interests and comply with the owner's wishes.

On the fixed-fee plan, however, his profit is determined when the contract is signed and from that date he is seeking to erect the building speedily so that he may release his organization to earn another fee; to erect it according to plans and specifications plus all later expressed wishes of architect and owner in order that the owner may again seek his service, and to erect it at the least cost compatible with the set standard of quality and speed in order that he may share in the savings. Naturally, the architect has an interest in these things. His work need be only that of interpreter and not of watch-dog.

TIME SAVED VALUABLE FEATURE.

Furthermore, the fixed-fee contract permits work to proceed on the day the contract is signed. Construction may go on coincidentally with the development of details. If speed is paramount, the fixed-fee plan permits saving weeks and often months which would otherwise be required for the completion of plans and specifications, quantity surveys, advertising for bids and final letting of contract. Under the lump-sum method, not one step can be taken until the contract is let, based on completed plans and specifications. Occasionally on the fixed-fee plan, a few dollars may be lost to an owner, due to the later detailed plans necessitating changes in the preliminary construction, but this seldom occurs.

An interesting comparison of results under the two methods has come to our attention. Two competing concerns decided at about the same time to enter a new territory and service could only start after new warehouses were erected. Two reputable general contractors were engaged, one upon the lump-sum and the other upon the fixed-fee basis. The lump-sum job, almost identical in size with the other, was started first but is not yet in service. The fixed-fee job was completed and in use in December. Owners of the latter advised architect and builder of the imperative need for speed and the successful outcome was the result, not of greater contracting ability, but of co-operation, trust and confidence on one job, and its lack on the other; and the possibility under the fixed-fee contract of beginning work on the signing of the contract, of excavating while foundation plans were being prepared and keeping the work throughout only one step behind the design.

From the standpoint of the builder, what are the benefits except as we share the satisfaction of owner and architect? Do we not render a definite service for which we should be paid? Is it not well that we know with some certainty what a given operation is to net us? Is it not legitimate that we put our profession upon a service basis comparable to that of the architect and engineer? Building contracting firms are notoriously short-lived and the fault is not, we believe, in the lack of business ability, so much as in the system.

ELIMINATING THE DISHONEST BUILDER.

But a more fundamental reason exists than those previously mentioned. I believe that the reason that this association should go on record as favoring the fixed-fee contract is that it will eliminate from the field the dishonest builder. It will eliminate the organization which has not the ability to do successful work and that elimination will come about through the impossibility of that firm obtaining new business.

Its record in the past will stand against it. Reputation is vital to a builder on fixed-fee operations. It is built up only through years of painstaking effort. It can be wrecked by a single operation. Therefore, dishonesty or lack of ability will promptly place a builder in such a position that he will be unable to stand investigation and therefore be unable to operate. There should be no room in the building field for other than able, conscientious builders.

To-day's practice, with some builders operating under the fixed-fee plan, is to refuse to make preliminary estimates in competition. If owner and architect have not enough confidence and trust to make a contract subject to the builder's making of a satisfactory estimate of probable cost, then they prefer not to serve, believing that they can do their best where the fullest confidence is reposed in them.

I sincerely believe that in these times of high building costs we can, through the fixed-fee plan, turn out a building at the absolute minimum cost. Costs are high at best. Legitimate projects are being passed up daily, due to the difficulty of figuring a profit on the use of structures at to-day's costs. Co-operation, through identity of interest and early covering in rising markets permitted through the fixed-fee contract, will help toward cost reduction.

I can only submit as further proof that the fixed-fee plan is right, the fact that my concern's history of repeat business is a surprise even to ourselves, and adequate proof to us that such a basis is logical, fair and in harmony with the times.

Art After the War

EVEN while the guns were demolishing villages and churning the land, men within the very sound of those guns were at work building. The whole countryside might be stricken as if with pestilence, but wherever military necessity demanded there ran through that worse than desert roads which men built under shell fire and then kept in repair. One of the inevitable results of war, visible even while war rages and inescapable as soon as war subsides, is this process of reconstruction.

After such a war as this, which is not yet technically at an end, the need of reconstruction extends beyond the region that shell fire could reach. In an interesting discussion of "Art After the War," a writer in the editorial pages of the "Outlook" states that those roads of France were symbols of men's minds. No one can read the literature produced in the trenches without realizing that just as men were busy reconstructing the highways across the devastated land, so men were busy building in their minds new paths for their thoughts to take the place of paths that had been obliterated by their war experiences. And just as the end of the war has released energy for the reconstruction of material things destroyed or displaced, so the end of the war has offered a new opportunity for the reconstruction of men's minds.

This which seems commonplace enough, and so obvious as scarcely to bear the saying of it, is, like many other obvious things, likely to be overlooked by those who are nearest to it and ought to see it most clearly. The age of reconstruction is distinctively the age of the artist. Primarily the artist is a builder, a creator. Whether the material he handles be pigment or clay or brick or imponderable sound, what he builds is ideas.

Indeed, there is nothing to-day so essential to the world as its art. Even the prophet and teacher of religion cannot avail unless he either has in him the creative power of the artist or can enlist that creative power in the service of the ideas he promulgates. The educator must be an artist, otherwise he will be simply a hearer of lessons or the keeper of a place of detention. The political leader must exercise the function of the artist if he would create new forms of law or of political action to meet the new situation. Whoever, in fact, is to have any creative part in reconstructing what the war has injured or replacing with something better what the war has destroyed, will succeed only to the degree to which he follows the laws and principles which it is the business of the artist to discover and in his product to reveal.

There still lurks in the minds of many, undoubtedly, the idea that an artist is a sort of super-entertainer, and that art is a form of restful amusement. Pictures, from this point of view, exist to provide relaxation for the tired business man who has the money to buy them; music is a counter-irritant to the cares and worries of the day or a soporific for soothing over-stimulated nerves. According to this view, there is no important distinction between good and bad art. If it amuses, relaxes, stimulates, or otherwise entertains and refreshes people, it is sufficiently good for its purpose.

There lurks, too, in the minds of many people who regard themselves as artists the idea that art is primarily for the self-satisfaction of the artist; that it is good to the degree that it expresses the emotion which the artist wants to express. Pictures, from this point of view, are but projections of whatever is in the soul or mind or nerves of the person who paints them. Music is the audible cry of the composer's spirit, whatever it may be. This idea of art ignores the interests of the tired business man, just as the business man's idea of art ignores the yearnings of the artist; but the two ideas have this in common—that the good or bad in art is a matter of comparative indifference. From neither point of view has the artist any need of a conscience or a standard.

In either of these senses art is a trivial thing. It is equally a silly luxury for the seeker of entertainment and for the person who imagines himself an artist because his emotions are too much for him. In a nation engaged in the serious business of finding order in the chaos that war has created and setting to rights the things that war has set askew, men with a sense of responsibility are rightly impatient with those who talk about art at such a time, if art is nothing more than a means of entertainment or a sort of emotional safety valve.

Art, however, is not a luxury; it is a necessity. It supplies to men the satisfaction of a craving as great as hunger or thirst. From time immemorial men have faced a world of chaos as we are facing it to-day. They have tried to think their way through the tangle, and those who have thought the most clearly they have hailed as their philosophers. They have groped their way to faith in an order underneath all this disorder, and those who have brought them the clearest light of faith they have hailed as their prophets. But men have not been satisfied, they never will be satisfied, with merely hearing about this order and beauty which they are convinced exists somewhere. They want that order and beauty made real to them. They

(*Concluded on page* 134.)

CONSTRUCTION

A · JOURNAL · FOR · THE ARCHITECTURAL
ENGINEERING · AND · CONTRACTING
INTERESTS · OF · CANADA

H. GAGNIER, LIMITED, PUBLISHERS
Corner Richmond and Sheppard Streets.
TORONTO - - - - CANADA
M. B. TOUTLOFF, Editor

BRANCH OFFICES:
MONTREAL—171 St. James Street,
E. R. Milling, Representative.
WINNIPEG—336 Qu'Appelle Street,
F. C. Pickwell, Representative.
NEW YORK—505 Fifth Avenue.
H. M. Bradley, Representative.

CORRESPONDENCE.—All correspondence should be addressed to "CONSTRUCTION," Corner Richmond and Sheppard Streets, Toronto, Canada.

SUBSCRIPTIONS.—Canada and Great Britain, $3.00 per annum. United States, the Continent and all Postal Union countries, $4.00 per annum, in advance. Single copies, 50c.

ADVERTISEMENTS.—Changes of, or new advertisements must reach the Head Office not later than the twentieth of the month preceding publication to ensure insertion. Mailing date is on the tenth of each month. Advertising rates on application.

CONTRIBUTIONS.—The Editor will be glad to consider contributions dealing with matters of general interest to the readers of this Journal. When payment is desired, this fact should be stated. We are always glad to receive the loan of photographs and plans of interesting Canadian work. The originals will be carefully preserved and returned.

Entered as Second Class Matter in the Post Office at Toronto, Canada.

WESTON WRIGLEY, Business Manager
FRED. T. HOLLIDAY, Advertising Representative

Vol. XIII Toronto, April, 1920 No. 4

Canadian Roofing Materials

We desire to call our readers' attention to an error in the second paragraph of the editorial on "Canadian Materials and Foreign Products," appearing on page 99 in our previous issue. The paragraph in question should have read: "In this connection attention is drawn to the fact that there is no Canadian-made roofing *tile* on the market," instead of conveying the rather unfortunate impression that there is no Canadian-made roofing on the market.

As roofing tile and slate are not produced in this country, it is necessary to import them in case that they are used, and at least as regards tile it will continue to be necessary until our own natural resources are developed. Apart from this, Canada is fortunate in having a number of large manufacturing concerns who produce roofing materials equal to the best to be found in other countries, including those of composite and patented character and high-grade asbestos and asbestos shingle products. Hence we take the earliest opportunity of making this correction, as the policy of Construction at all times has been to give the fullest measure of support to Canadian interests. The editorial in question was based on recent opinions expressed by certain architects in discussing the subject of building materials, and its direct object and purpose was to set forth views which, we believe, are of interest to Canadian manufacturers.

◆

Ontario Architects Increase Fees

The decision of the Ontario Association of Architects to raise their scale of fees, cannot be construed as placing an additional premium on professional ability, but rather as a step which aims to provide something more adequate in the way of compensation for the services which an architect renders.

According to the new scale the minimum charge hereafter for services will be as follows:

1. In the case of factories and large plain buildings involving no detailed interior finish, five per cent. of the total cost, in place of the former charge of four per cent.
2. In the case of public buildings, office buildings, warehouses, banks, and ordinary buildings, six per cent. in place of five.
3. In the case of residences, from eight to ten per cent., according to the amount of special detail work required, in place of the former charge of from seven to ten per cent.

The total cost of the building is now interpreted to be the cost to the owner of the completed building, including any material or labor that may be supplied by the owner apart from the contracts.

The only other important alteration in the basis of charges is that whereby charges are to be increased to cover the cost of the services of a specialist when required in the case of heating, ventilating, mechanical, electrical and sanitary problems of a special nature.

The increase thus provided will represent something slightly more equitable and remunerative for the class of work which an architect does. It is now an established fact as regards the profession in the United States that only eight out of every hundred architects are required to pay income tax, and it is doubtful if here in Canada the proportion is any greater. Hence the new schedule of charges is not only justified, but is altogether necessary. Under existing conditions, architects both in Ontario and the other provinces are called upon for many extra services, and to attempt to do work for less than the revised schedule provides is simply to invite a personal loss, or otherwise imply that the owner is prepared to accept only partial service in the attention and supervision of his project.

The Charm of Natural Planning

IN the various schemes which are put forward in these days for city planning and development the main fault seems to me to lie in the attitude of the designer, which is usually that of a cold and calculating schemer, writes M. H. Baillie Scott in "The Architectural Review" of London. This brutal and callous scientifis spirit can never give to us the city of our dreams. We must set out to realize as far as we can the New Jerusalem—a heaven on earth—and test all our conceptions by the touch-stone of that ideal. We ought to approach the matter from the right end and start with the unit of our design, which is the house itself. And since it is desirable that houses should be of rectangular form, it follows that groups of houses should be rectangular, too, and that radiating and diagonal lines of roads which chop the buildings adjoining them into awkward shapes should be avoided. The best plan for a city is surely the old one—in which within a walled enclosure four main roads meet in a central market square. The four wards of the city are subdivided into smaller squares by smaller streets, and this scheme logically implies the arrangement of houses into courts approached by archways from the streets. This court arrangement, of which we find so many beautiful examples in old towns, is surely the finest way we can conceive of combining buildings, and more especially so when the scale is not too large. For an example near at hand, could anythin gbe better than the little court of Staple Inn with its old paving and central tree? Such exquisite surprises as that are worth all the dreary endless avenues our town-planners rejoice to inflict upon us.

Apart from scietific expediency, the modern town planner seems chiefly to aim at "splitting the ears of the grundlings" by something colossal and immense in scale. He has yet to learn that art is not a question of avoirdupois and that the best kind of beauty is to be found in quite simple and humble things. The vulgar desire to "lick creation" with some immense building seems to pervade all our modern conceptions. It is the Prussianism of art. Adjoining buildings of reasonable scale are dwarfed by colossal monsters built at huge expense. Examples in this kind are to be found in most of the central parts of London, and all the sane and simple work of the eighteenth century has to give way to hideous vulgarisms in stone. Nothing is more pitiable as a spectacle than the puffing and blowing and strutting like the frog in the fable on the part of our designers. It is a disease of the mind, and in any modest and sane community would be treated as such.

But, bad as such buildings are in their senseless waste of human labor, they are not perhaps so disastrous as the modern suburb, and more especially when it takes the form of what is called, for some unknown reason, "the garden suburb." Here we have vague and sloppy arrangements of dwellings which go to the other extreme of scale. They are gabled and fussy and petty. They pose and smirk at us in their self-conscious artistry. It is the fashion now to say rude things about the slums, but there are not a few back streets in London which merely want cleaning up to make them excellent dwelling-places for those who do not want to be way laid by self-advertised art every corner. For my own part, I would choose one of these in preference to any garden suburb I have seen. They are restful and peaceable and honest, and they make no pretensions of any kind.

And now we have invented a new horror in building. It is the colony of "dwellings for the working classes." The phrase itself carries with it the condemnation of our social system, implying as it does a broad division of the community into those who work and live in duplicated little dwellings imposed on them by the State, and those who don't work and who live where they ilke or can.

Would it not be possible to return to the old and better way of building, when towns were definitely outlined conceptions set in natural country surroundings? If in such a case further building is required, would it not be better to start from a series of subsidiary centers instead of creating vague and nebulous suburban areas which are neither fish, flesh nor good red herring? And why should we isolate and segregate our workers like lepers from the community? In the old village the squire and parson contrived to exist in close association with their humble neighbors.

It is a question how far the making of a town should consist of the realization of a predetermined plan, or how far it should be allowed to develop naturally. It would seem the best way to lay down at least the main lines, and yet leave some possibility of variation in the lesser streets.

If a plan fully takes into consideration the levels of the ground and local features such as trees, it will necessarily become somewhat varied in its general aspect. Planning of the best kind has all the air of natural development, because the designer has yielded to local conditions and allowed them to mold and modify his initial conception.

Where there is no vision the people perish. The materialism of science as applied to building will never satisfy our souls. Our towns and cities should be the expression o fthe best of the art powers of the community. That is the proper field of the artist, and not the collection of pictures in a gallery which no one needs, and only a few wish to look at. Building should be the highest expression of the spirit of man, and not merely a dull and soulless record of what are supposed to be his material needs. And we who enjoy the privilege of living in a country which still possesses so many great examples of old buildings have little excuse for ignoring the lessons they convey.

Gypsum Wall Board Successfully Withstands Fire Test

The insulating properties of gypsum board and its success as a fire-resisting material were satisfactorily demonstrated in the fire test recently conducted at Toronto, at the rear of No. 1 Fire Station. The demonstration consisted in subjecting two panels or wall sections erected for the purpose to the direct action of fire for a period of 35 minutes duration. The panels which were approximately 12 by 16 feet, were built of ordinary 2 by 4 studding protected with wall board consisting of a 1/4-inch layer of hard wall plaster bonded to a 3/8-inch gypsum plaster base. One panel was faced with clapboarding and the other with a Portland cement stucco one inch thick, the back of the two panels being finished with ordinary inside wall plaster.

While the clapboarding was quickly consumed, and the cement stucco damaged due to the expansion caused by the extreme heat, the two panels remained intact at the end of the test with the gypsum board protection practically unimpaired. An added circumstance was a strong wind which sprang up at the time and which contributed to make the test more convincing. The insulating properties of the material were fully established by the fact that no heat penetrated the wall and that at any time during the progress of the fire it was possible to place the bare hand on the rear of the panels and to find them absolutely cool.

The test has a particular value at the present time in that it proves the advantage of gypsum board as a durable and inexpensive material which can be profitably employed in helping to keep down costs in housing development. The demonstration was conducted in the presence of a number of architects, contractors and others, including representatives of the city architect's office and fire department, and will likely be made the subject of report, which in view of the economy claimed for this type of construction, should be of general interest.

Personal

Stanley T. J. Fryer, O.A.A., and William G. Evans, Hamilton, Ont., whose office has been closed owing to both members being away on active service in France, have again resumed architectural practice in the Home Bank Building, James Street North. Catalogues and price list from manufacturers and supply firms are desired.

Messrs. Eden Smith & Son, architects, Toronto, have formed a partnership with Mr. A. S. Mathers. The business will be carried on at 33 Scott Street under the name of Eden Smith & Mathers.

H. L. Symons & Co., engineers and contractors, have opened offices at 43 Scott street, Toronto. They will be very pleased to receive catalogues and price lists from supply firms.

The Asbestos Mfg. Co., Limited, manufacturers of asbestos shingles, slates, etc., Montreal, have opened a sales office in Toronto, with Mr. Grant Sclater in charge.

Canadian Firm to Manufacture Mixing Valves

Arrangements have been concluded with the patentees by the Mueller Mfg. Co., Limited, of Sarnia, Ont., for the exclusive right to manufacture the Niedecken Mixing Valve in Canada. These mixing valves, it is claimed, represent the highest type of development in this class of product. They are regularly specified by the larger architectural firms in Canada and the United States for installation in public buildings, hotels and private homes. The established reputation of the Mueller Co. for goods of quality is the best assurance of the turning out of a high-grade product, and will undoubtedly greatly increase the demand for Niedecken Mixing Valves in Canada, in addition to facilitating the matter of prompt deliveries.

New Slate and Material Firm

A new concern known as the Slate Products Company of Canada, Limited, Montreal, has been formed with a capital of $200,000, for the purpose of carrying on a business of quarrying, manufacturing and dealing in slate, stone, lime, cement, brick, gravel, etc.

DIXON'S
ELDORADO
"the master drawing pencil"

Canada Trust Building, Toronto

(*Continued from page* 109.)

The upper floors are used for offices of various financial concerns and are planned to specially suit the individual requirements of each tenant.

The basement is entirely devoted to the cafeteria, and is considered to be a model of its kind from a sanitary and artistic point of view, and is planned to ensure the most economical operation.

The facade is designed along the lines of utmost simplicity and stands out by comparison with the usual ornate design of banking institutions. This simplcity has been carriel out by the architects in all the branches of the Canada Trust Company, it being this bank's desire to not only express the stability of their institution by their front elevations, but impress upon the public that they are practicing rightful economy in their buildings. The facade is of Grey Canyon Limestone, with tile roof and steel sash, and presents a pleasing contrast by comparison with the surrounding buildings.

The total cost of alterations amounted to approximately $125,000.00.

The new Market Branch at London, Ont., which is also llustrated, is another of several buildings erected for the same corporation in various parts of Ontario within recent date.

British Columbia Forest Products

British Columbia Lumber Commissioner

No. 1 Adelaide St. East
(Street Floor)
TORONTO

Personal calls or correspondence cordially invited from Dealers and others interested in British Columbia Woods.

Telephone Main 6872

Note: We do not quote prices

Art After the War

(*Continued from page* 130.)

want it in a form that they can live with; and those among them who have taken out of this chaos and disorder material out of which they have built forms of beauty and order and truth they have hailed as artists. Whether it be a cathedral or a poem, whether it be a statue or a symphony, whatever creation of man embodies this conception of order in a way that gives lasting satisfaction to that craving for order, men have kept and cherished. And every epoch in history has supplied its own embodiment of this conception; for each generation of men in its turn has discovered chaos and disorder for itself and has therefore wanted its own disproof of what it has seen in its own ugly present.

To the very extent to which America needs to rebuild her mind after the war, to that extent she needs a pattern according to which she can build. This is no time for men capable of being artists to devote their gifts to the service of the tired business man or to the indulgence of their own emotional appetite. It is ehe time for the artist to be what he may be—the leader of a people through the wilderness to a promised land.

◆

CONTRACTORS and SUB-CONTRACTORS

As Supplied by the Architects of Buildings Featured in This Issue.

CANADA TRUST BUILDING, TORONTO.

Carpentry, The Jackson-Lewis Co., Limited.
Electrical Work, Richardson & Cross.
General Contratcors, The Jackson-Lewis Co., Limited.
Glass & Glazing, Pilkington Bros.
Hardware (finished), Canada Hardware Co.
Heating, Purdp, Mansell, Limited.
Iron Work, Architectural Bronze & Iron Works.
Marble & Tile, Italian Mosaic & Marble Co.
Masonry, The Jackson-Lewis Co., Limited.
Mill Work and Trim, R. Laidlaw Lumber Co.
Painting, Bavington Bros.
Plastering, Andrew Petrie & Co.
Plumbing, Purdy, Mansell, Limited.
Reinforcing Steel, Trussed Concrete Steel Co.
Roofing and Sheet Metal Work, Douglas Bros., Limited.
Sash (Casement), Trussed Concrete Steel Co.
Steel (Structural), Hepburn & Disher.
Stone (Cut), Geo. Webb.
Mail Chute, Cutler Mail Chute Co.

BANKERS' BOND BUILDING, TORONTO.

Cut Stone, Page & Company.
Mason Work, F. & A. E. Ham.
Carpentry, A. & F. Fisher.
Painting, F. G. Roberts & Company.
Plumbing, McNaughton & Mackenzie.
Heating, McNaughton & Mackenzie.
Bronze Doors & Grilles, Douglas Bros.
Electrical Work, R. A. L. Gray & Co.
Vaults, J. & J. Taylor, Ltd.
Sculpture Work, Ira Lake.

ALLEN THEATRE, WINNIPEG.

General Contractor, A. McDonald.
Structural Steel, Dominion Bridge Company.
Heating, Green & Lister.
Plumbing, Green & Lister.
Decorations, T. Jagman.
Plaster Work, J. Davidson.
Electrical Work, Mundy Roland.
Marble & Tile, Hooper Company.
Sheet Metal Work, Winnipeg Ceiling & Roofing Company.
Ornamental Iron Work, Manitoba Bridge Company.
Stone Work, Olliver & Munson.
Brick, J. D. Woods.
Brick, Alsip Brick & Tile Co.

CONSTRUCTION

May, 1920 Volume XIII., No. 5

CONTENTS

HART HOUSE, UNIVERSITY OF TORONTO 137
An Explanation of Its Purposes—By Vincent Massey, M.A.

A DESCRIPTION OF HART HOUSE PLAN 141
By W. A. Langton.

MECHANICAL EQUIPMENT OF HART HOUSE 151
By Walter Kay.

HART HOUSE THEATRE 158

CONCRETE, ITS USES AND ABUSES 162
By Irving K. Pond, F.A.I.A.

EDITORIAL 165
The Claims of the Canadian Architect.

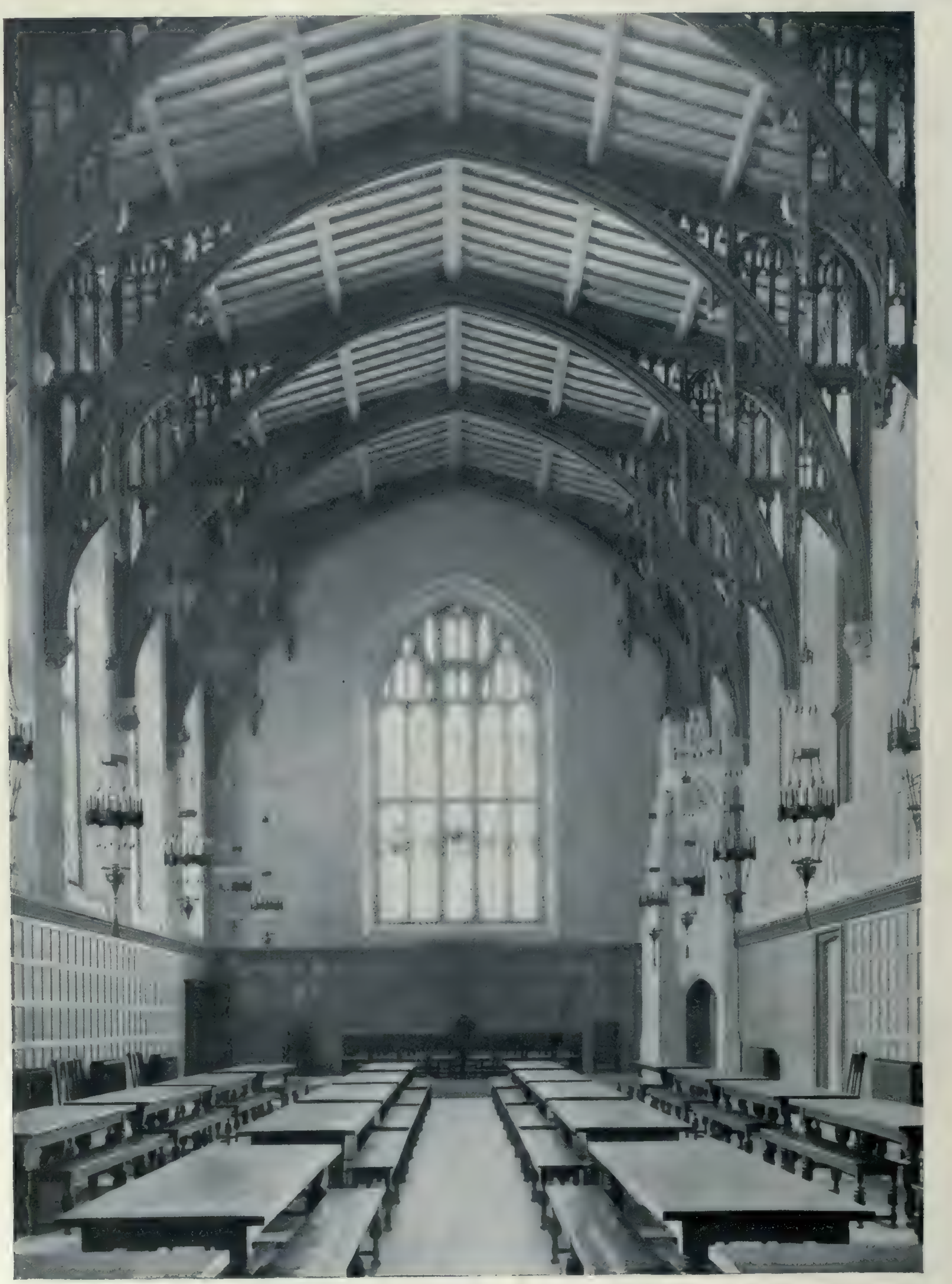
PERSONAL ITEMS 166

Full Page Illustrations

GREAT HALL, HART HOUSE, UNIVERSITY OF TORONTO 136

GENERAL EXTERIOR VIEW, HART HOUSE, UNIVERSITY OF TORONTO 138

H. GAGNIER, Limited, Publishers
GRAPHIC ARTS BLDG., TORONTO, CANADA
BRANCH OFFICES
MONTREAL NEW YORK



GREAT HALL,
HART HOUSE,
UNIVERSITY OF TORONTO

SPROATT & ROLPH,
ARCHITECTS.

Photographs by G. D. Haight.

Hart House, University of Toronto

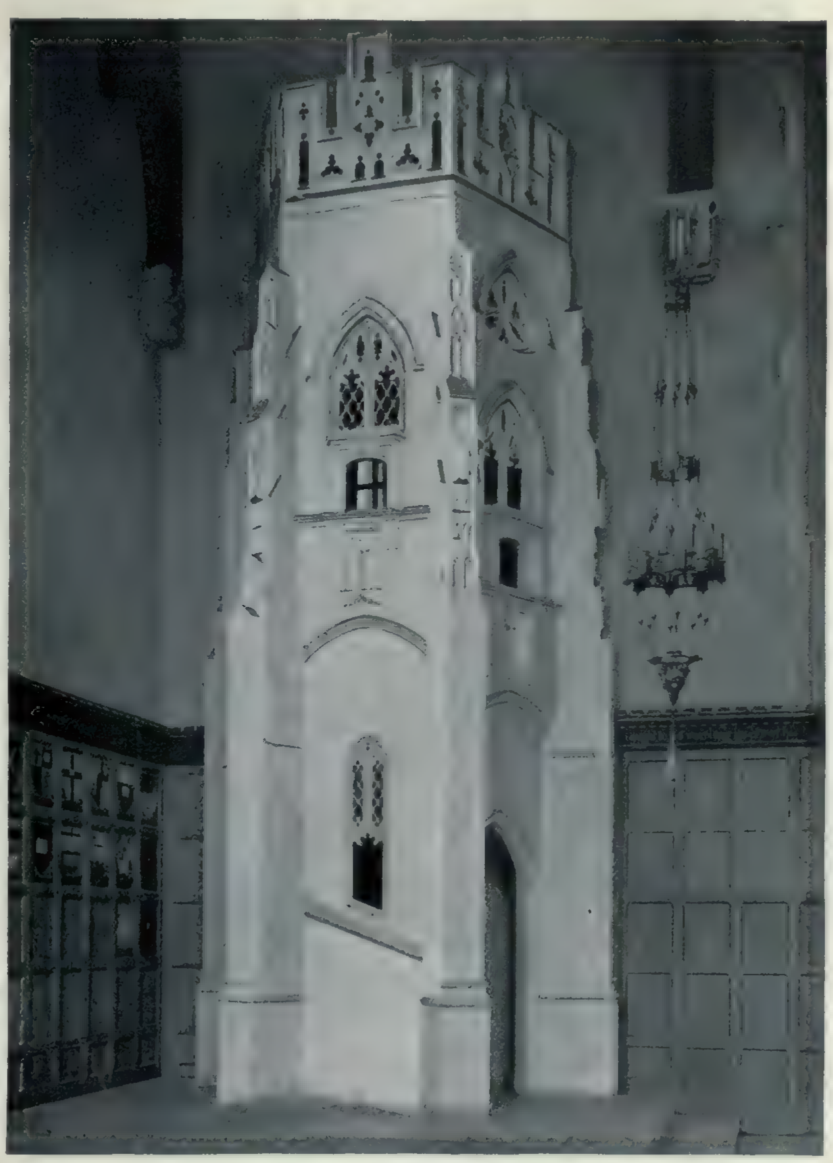
An explanation of the purpose of the building taken from an address by Mr. Vincent Massey, M.A., at the Opening Ceremony.

THE project of Hart House was conceived in 1910, when it became evident that the Young men's Christian Association stood in need of better rooms and that the Under-graduate body required quarters in the nature of a club. To meet these needs the Executors of the Estate of Mr. Hart Massey, of Toronto, offered to give to the University a building which would serve as a memorial to the founder of the trust, and bear his name. This offer was accepted and construction commenced in 1911.

Owing to the war, Hart House developed slowly, but the pause in its erection gave an opportunity to widen its scope. It is perhaps not incorrect to say that the House as it now stands is intended to represent the sum of those activities of the student, which lie outside the curriculum. These activities are not unimportant; indeed, I would submit that the truest education requires that the discipline of the class-room should be generously supplemented by the enjoyment, in the fullest measure, of a common life. A common life, of course, presupposes common ground. At this University it happens that but a very small proportion of the students can enjoy the advantages of the community life provided by a college. It is perhaps unlikely that we shall ever see in Toronto a completely developed collegiate system. But even it this were the outcome, there would still be the need, indeed the greater need, for the unifying force which it is one purpose of this institution to introduce into the University.

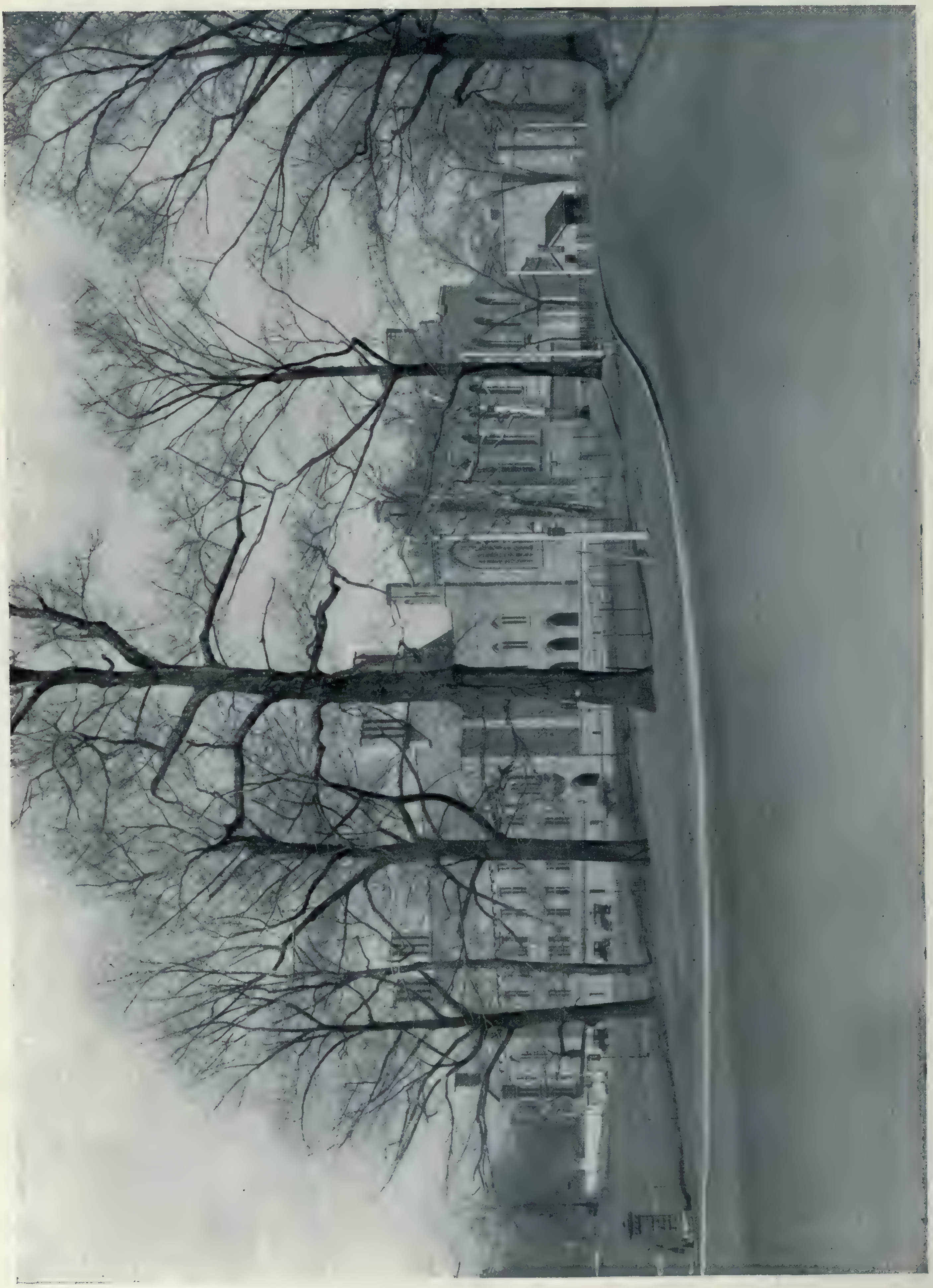
Hart House, in one sense, may be described as a Students' Club, but the purpose of the House is wider. It is greatly to be hoped that this place from the many angles at which it touches the life of the student, will exert an influence of the most positive nature, in giving him a real sense of membership in an academic family, and in making him conscious of a very noble tradition, which it is his duty and his privilege to maintain.

Furthermore, let us hope that not only will the House serve the interests of the active members of the University of Toronto, teachers as well as undergraduates, but that it may help to bridge the gulf of time and space which too often separates the graduate from his University. Here will be a place where the present and the past generations may meet, and here, let us hope, may be fostered the lasting loyalty and the *esprit de corps* which are essential to the welfare of any seat of learning.



STAIR ENCLOSURE: GREAT HALL.

This House has been built for the men of the University, and save for special occasions will be reserved for their use. May I explain here, lest misunderstandings arise, that this condition was due in no sense to a lack of appreciation of the benefits of the co-educational system—a system which is so firmly established and vindicated as to require no defence—but entirely to the fact, quite as little in need of explanation,



GENERAL EXTERIOR VIEW.

HART HOUSE, UNIVERSITY OF TORONTO

SPROATT & ROLPH, ARCHITECTS.

that the purpose of this building could not be achieved were it to be occupied jointly by men and women.

It is a source of profound gratification, to anyone associated with Hart House, that the building during the years of the war, was able to make some contribution to the cause which, at the time, stood of paramount importance. From the autumn of 1914 until a few months ago, the structure was used for military purposes, and for some years when construction was all but suspended, it was almost entirely occupied by Military Training Schools. On the south facade are carved the devices of the principal units which occupied the building; the Officers' Training Corps and Overseas Training Company of this University, the District School of Musketry, a Cadet School of the Royal Air Force, and a unit of the Canadian Army Medical Corps. Of those who passed through these schools there were many who, had they returned, would have enriched the life of this place. We may remember them along with the great company to whose memory we do especial honor to-day.

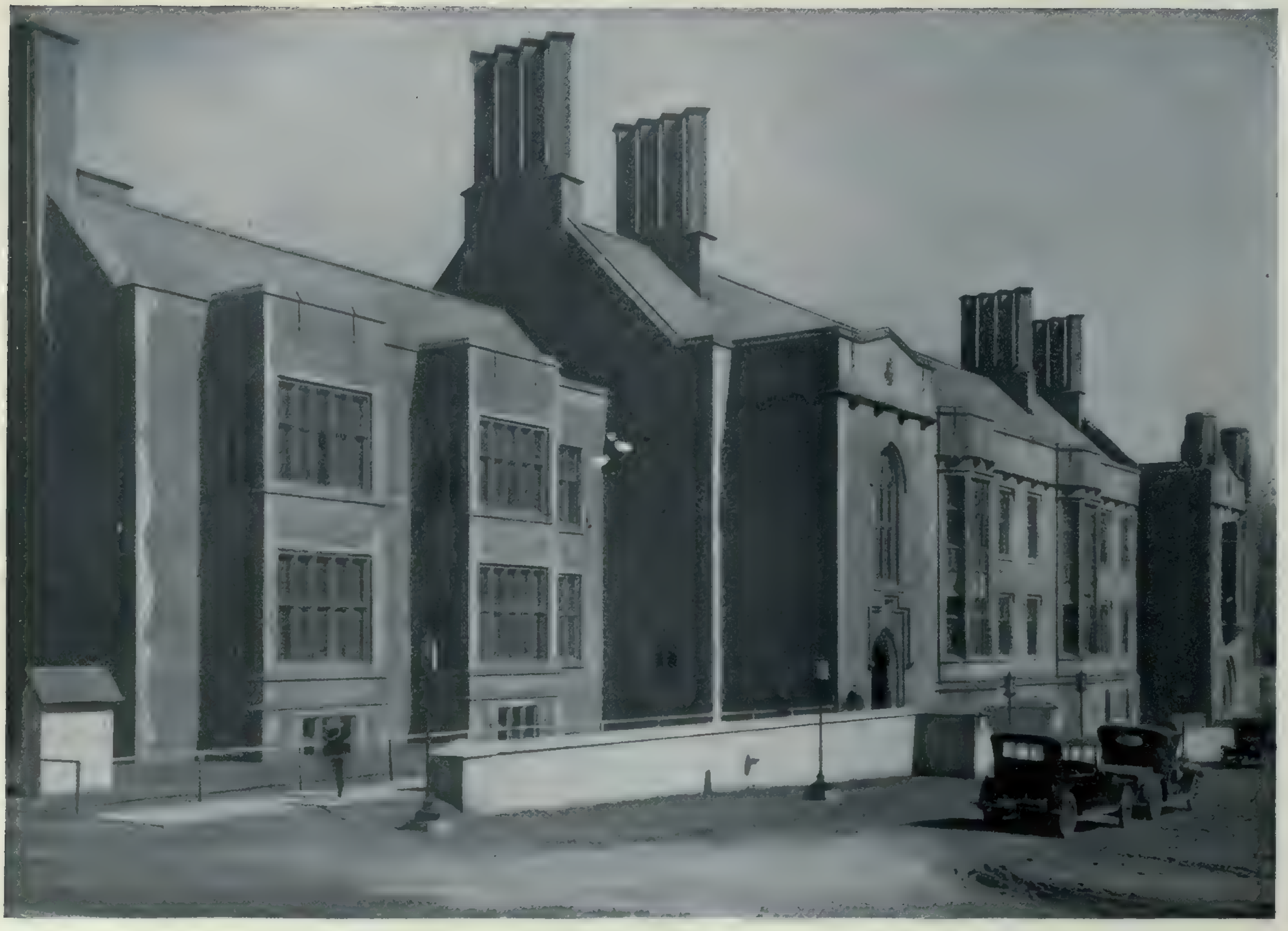
It is a very great pleasure to be able to pay some small tribute to the work of the architects, Mr. Henry Sproatt and his colleague Mr. Ernest Rolph. One finds it difficult to overstate the idealism and the devotion which both these gentlemen have applied to their task. Their object was the creation of a work of art in the true sense, but they never failed to strike that fine balance between beauty of design and utility of purpose, the achievement of which is one of the major problems of architecture. Their enthusiasm, energy and patience in this work have been unbroken.

I would not forget, too, to refer to those individuals and firms who have sympathetically co-operated with the architects, and under their inspiration, have produced the actual fabric. On the imaginative, as well as on the purely structural side, the execution of this work has been most painstaking and entirely conscientious.

If the direction of the building was sincere, the workmanship has been no less so. It too often happens in these days that the pleasure of self-expression has passed from manual work. On this structure, due both to the length of the period during which it was in process, and to the nature of the work itself, it was possible to preserve something of the spirit of individual achievement, which is associated with another age. The craftsmen on the building, and I use this honorable term advisedly, have shown both corporately and individually, that the mediaeval joy of creation has not entirely passed. It is a satisfaction to know that, save for one or two instances, they were all Canadian citizens.

Hart House passes to-day from the phase of preparation to that of accomplishment; from the period of anticipation to that of fulfillment. The work is done and the House stands a completed thing. But with the last blow of the hammer the building is finished in only one sense. The bricks and mortar are but the bones; the community of Hart House must provide the spirit. But I have no fear for what may be called, in its widest sense, the spiritual side of the House. The institution has been organized on an ordered plan; presiding over its fortunes is a gentleman, on whose appointment as

QUADRANGLE.

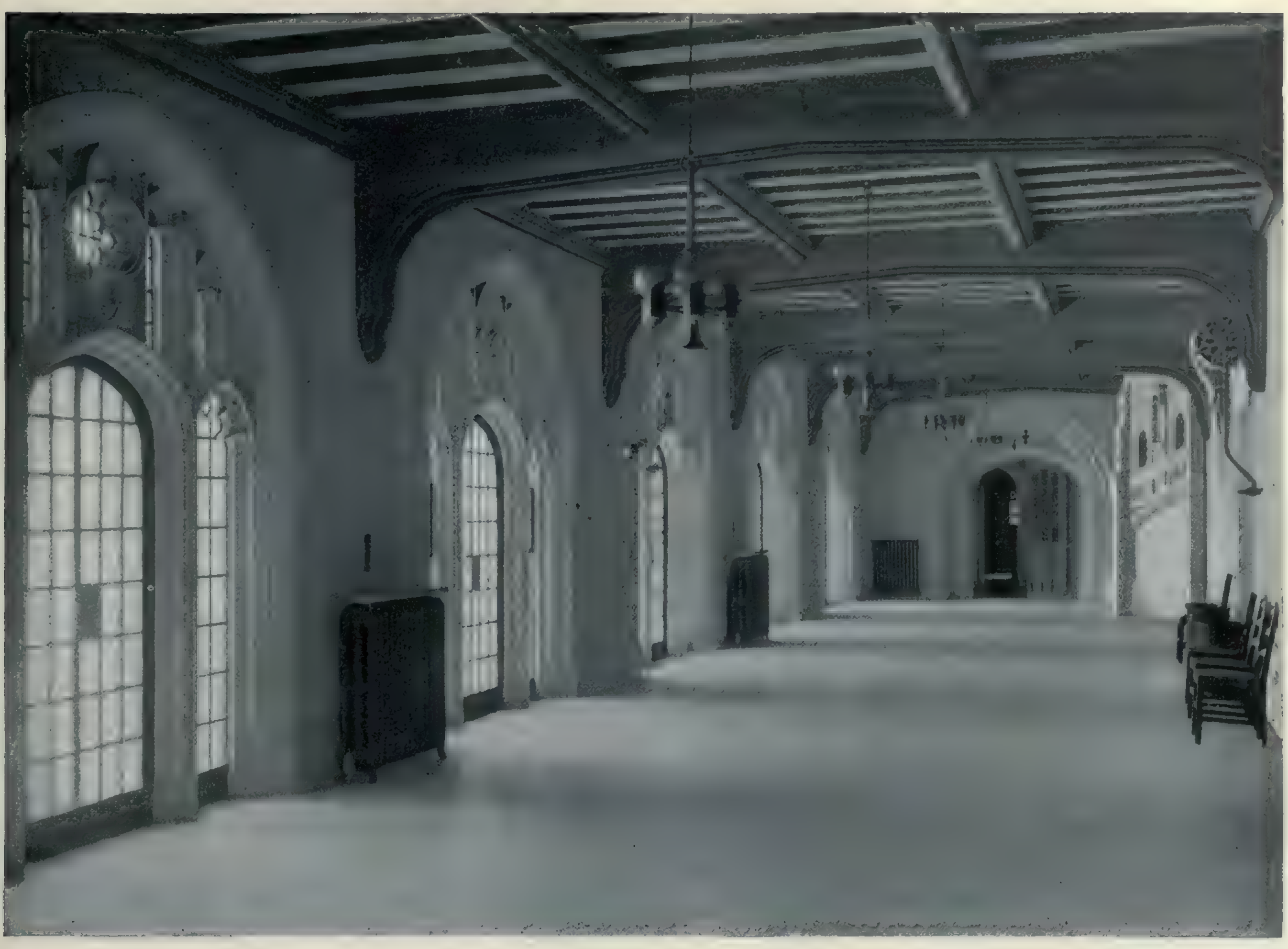


VIEW ALONG SOUTH FRONT.

Warden of the House, the University is to be congratulated; and associated with the Warden, in his task of administration, are a group of men, whose leadership in many departments of student life, will give the fabric coherence, symmetry and a genuine purpose. I make no doubt that the building through the personalities which alone can give it vitality, will take its part in what must perhaps be the supreme function of a University, the development of individual character.

Perhaps in closing I can do no better than to quote from the commemorative inscription shortly to be unveiled by His Excellency, which sets forth in formal terms the purpose of this place:

"The Prayer of the Founders is, that Hart House, under the guidance of its Warden, may serve, in the generations to come, the highest interests of this University by drawing into a common fellowship the members of the several Colleges and Faculties, and by gathering into a true society, the teacher and the student, the graduate and the undergraduate; further, that the members of Hart House may discover within its walls the true education that is to be found in good fellowship, in friendly disputation and debate, in the conversation of wise and earnest men, in music, pictures and the play, in the casual book, in sports and games and the mastery of the body; and lastly, that just as in the days of war, this House was devoted to the training in arms of the young soldier, so in the time of peace its halls may be dedicated to the task of arming youth with strength and suppleness of limb, with clarity of mind and depth of understanding, and with a spirit of true religion and high endeavor."



LOWER GALLERY.

Hart House: A Description of Its Plan

By W. A. Langton.

THE name of Hart House makes it a memorial to Mr. Hart Massey, of Toronto, by whose executors the building was given to the University, as part fulfilment of the aims of the Massey Foundation of which they are trustees.

The idea of such a building appears to have originated with Mr. Vincent Massey, who, as an undergraduate of the University, saw that the importance of the students' activities, outside of the curriculum, were in the way of suffering for want of proper housing, and, on the other hand, were worth fostering by being given a proper building. It is the combination in one building of proper accommodations for all the students' social requirements that makes Hart House unique. In other universities there are gymnasiums, club rooms, dining halls, etc., but they are in separate buildings. This is a good thing for the architect but, as Mr. Vincent Massey's address at the opening of Hart House seems to suggest, is not quite so good for the student as a single building, where men of different pursuits have opportunities of meeting one another, instead of being further separated by the accident of frequenting separate buildings.

There is no doubt, however, that so far as the architects were concerned, Mr. Massey's idea presented a tough proposition. The problem was to combine, in one building, of a dignified collegiate appearance, proper accommodations for the following requirements:

A Dining Hall with the most modern appendages.

Several Common Rooms.

Several Rooms for Officers and Committees of Students' Associations.

A Library.

A Reading Room.

A Music Room.

A Drawing or Painting Room.

Photographic Dark Rooms.

A Lecture Hall.

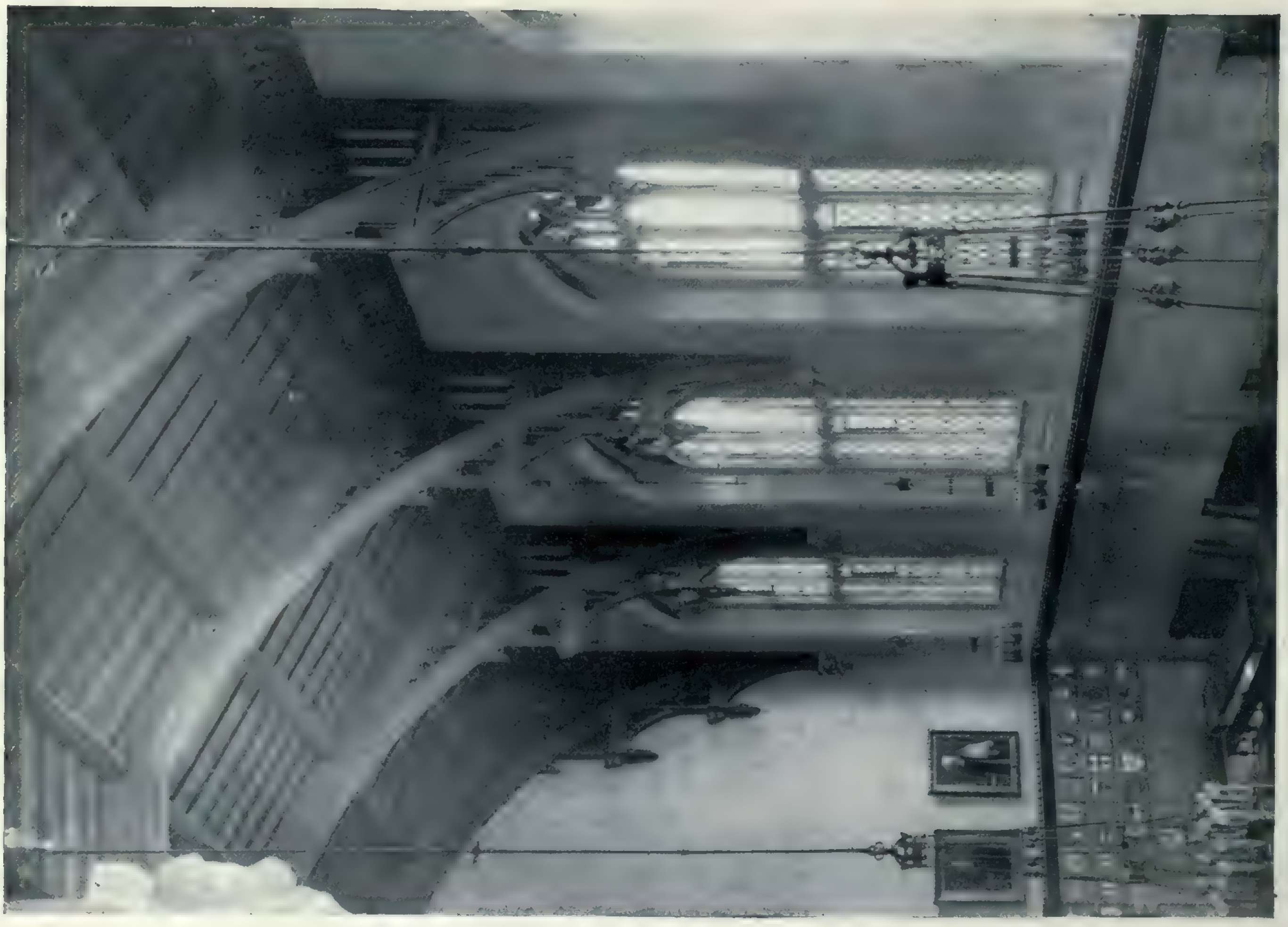
Y.M.C.A. Offices and Library.

A Chapel.

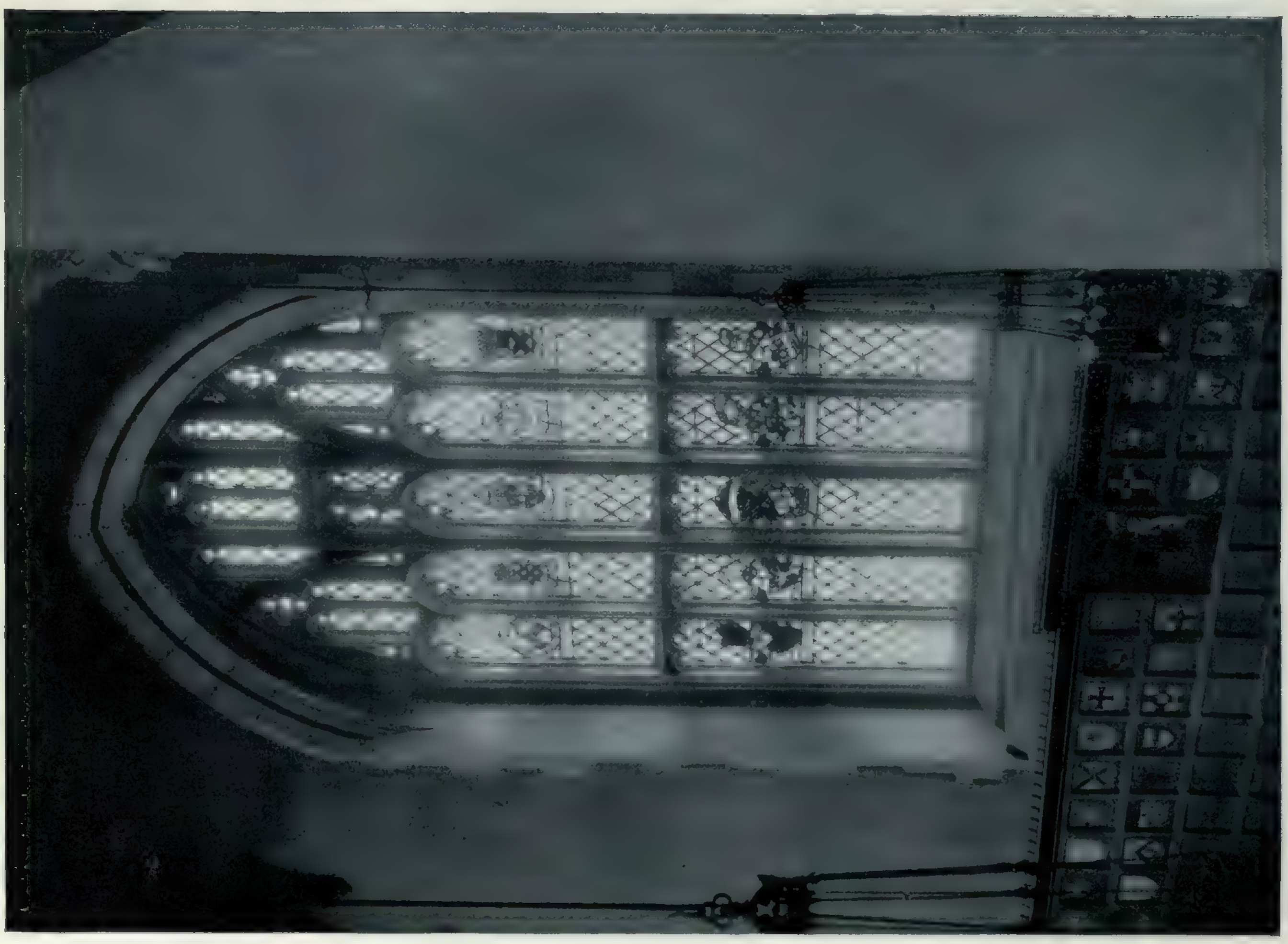
Billiard Rooms.

Athletic Rooms for boxing, fencing, wrestling, basketball, etc.

Squash Racquet Courts.



CORNER OF GREAT HALL.



SOUTH WINDOW, GREAT HALL.

HART HOUSE, UNIVERSITY OF TORONTO

SPROATT & ROLPH, ARCHITECTS.

Locker Rooms and Dressing Rooms.
A Gymnasium.
A Running Track.
A Swimming Pool.
A Theatre with dressing rooms, green room and complete appointments.
A Barber's Shop.
Residential quarters for the Staff.
Residential quarters for the Warden.
Bedrooms for guests.

The rooms in this list should be called, for the most part, departments rather than rooms, for there are minor rooms in connection with most of them. In particular there are cloak rooms and lavatories, in large number, dispersed throughout the buildings where they are convenient for either the habitués of the building or their guests.

This complex problem is what the architects had to face. It is at the bottom severely practical. There is but one department, the Dining Hall, that lends itself to external architectural treatment in a recognized way. There is among the other important departments too much of athletics, one would think, to suggest for the architects a happy course along the broad and flattering road of conventional architecturalism.

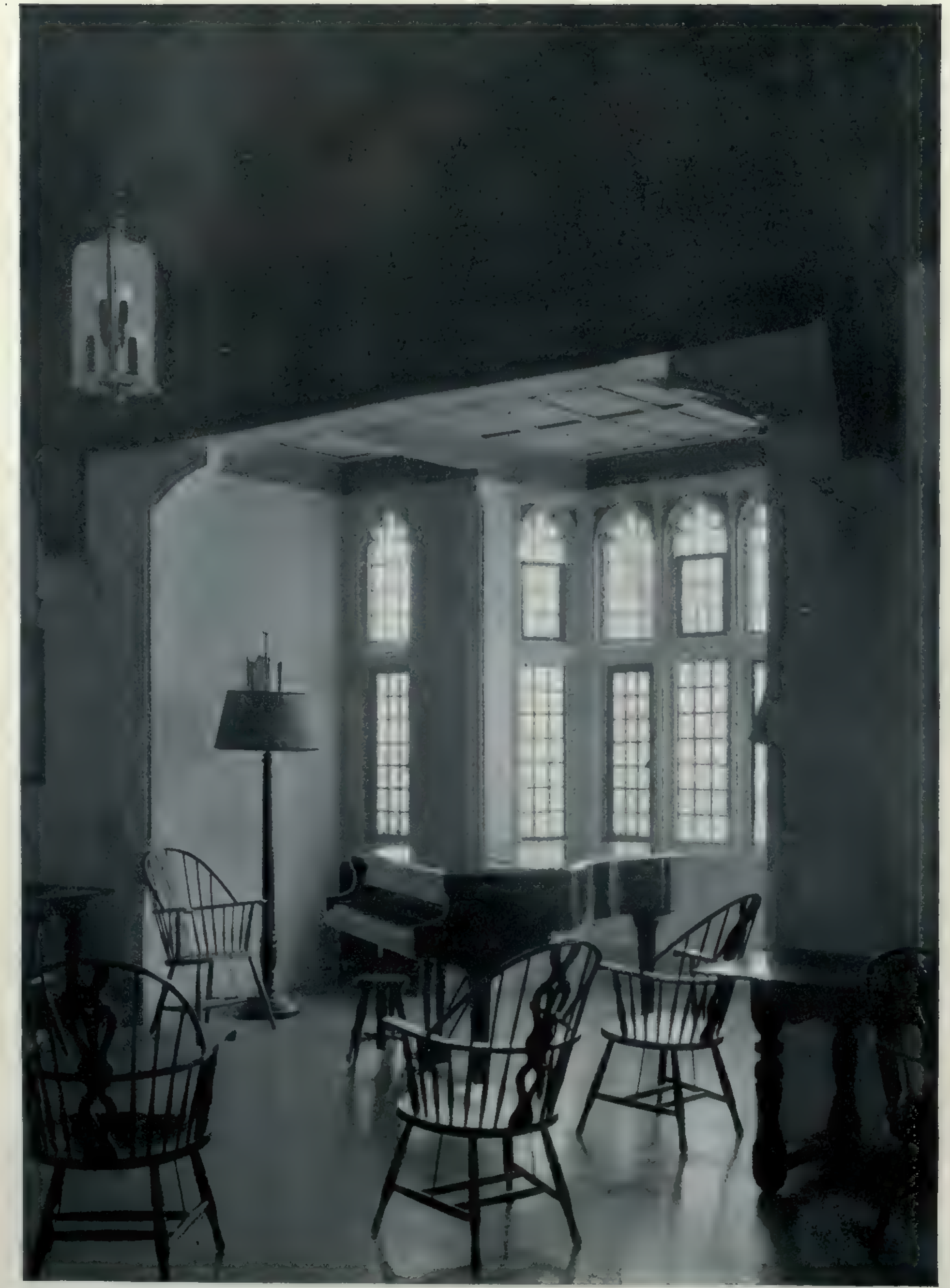
It is to the credit of Messrs. Sproatt and Rolph that they have not thought of mitigating the purely scientific treatment of a modern gymnasium by giving a pseudo-architectural appearance to any part of its construction. The severely practical character of all the athletic rooms is an excellent testimony to the truth of the maxim of architects that the true artist is most truly a practical man. In the case of the architects of this building, there has been the additional advantage that both members of the firm are artists. Though Mr. Rolph addicts himself to superintendence and Mr. Sproatt to design, Mr. Rolph was originally a designer too; and both members of the firm are distinguished as men of taste.

The solution of the athletic problem is very simple; it is, in one word, skylights. The skylight roof, if it does appear, is quite seemly; but as the athletic department is kept to the north, where there is rather close proximity to Wycliffe College, the glass roof is not easily seen, if at all. The wall elevation is admirable; too good to be so little in sight. The long narrow windows of the upper part of the gymnasium and the buttresses of the roof, make a characteristic northern elevation, quite as beautiful in its way as the more expansive southern front.

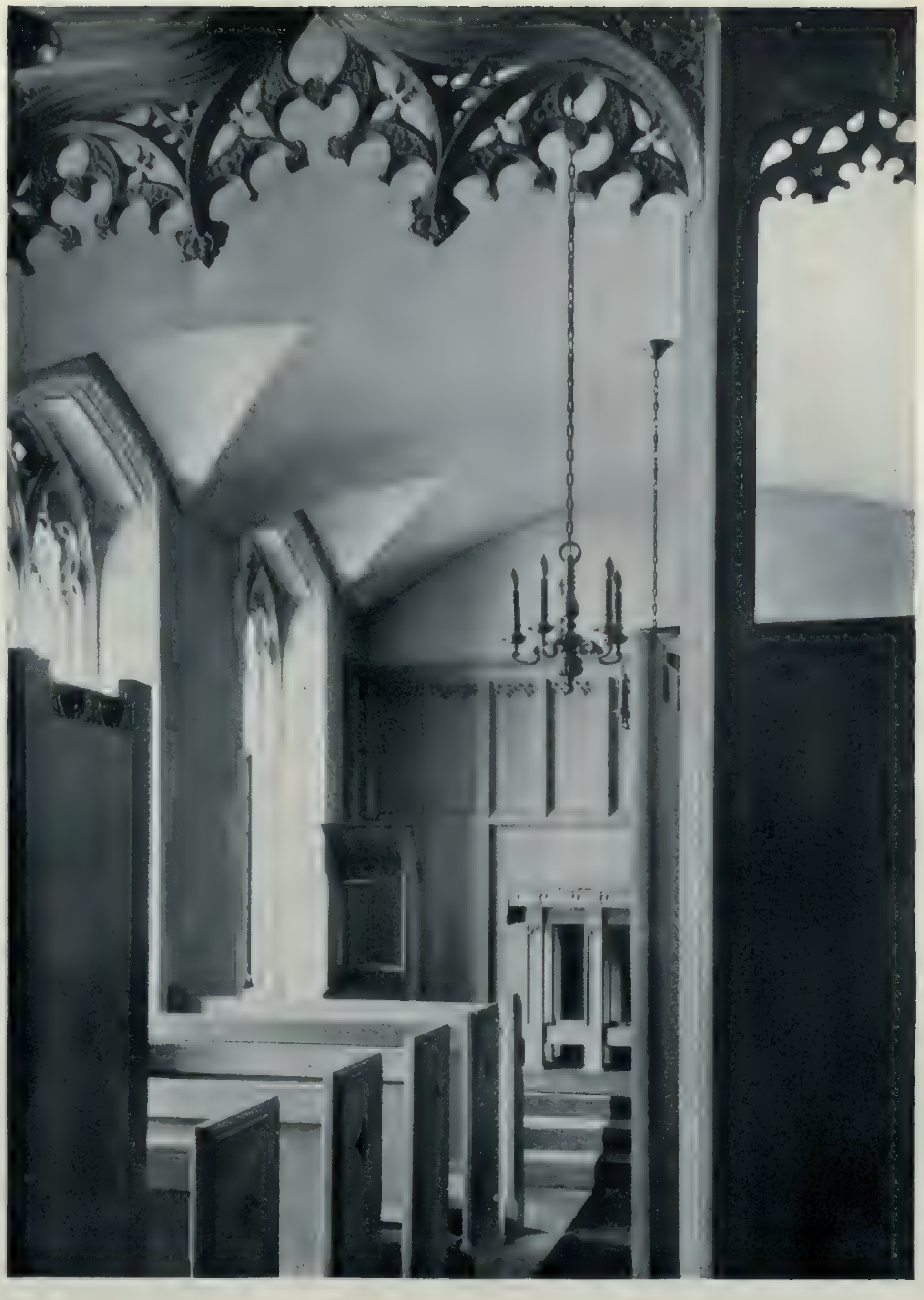
The gymnasium must have an open roof because of the numerous attachments that are necessary for the gymnasium apparatus. In the swimming pool, which has no need of this kind, the steel roof is enclosed in a segmental plaster ceiling, carried by substantial rectangular piers, and penetrated, between the piers, to combine with the ceiling of the gallery. Lighted from this graceful ceiling by a skylight with a slightly blue tinge that gives color to the water, the swimming pool is a beautiful place.

On the same level as the pool, neatly screened, as the plan shows, from a possible public in the galleries over the pool, is the main bathroom, with various showers, rubbing rooms, and other requirements of the athletic behind-the-scenes. The locker room adjoins. By the tote-box system 1,000 lockers can serve 2,000 persons. The athletic clothes are kept stored and attended to in a small box, which, when these clothes are wanted, is taken out and carried to one of the lockers. There the change of clothes is made,

STONE STAIR OF LOWER GALLERY.



MUSIC ROOM BAY.



CHAPEL.

HART HOUSE, UNIVERSITY OF TORONTO

SPROATT & ROLPH, ARCHITECTS.

MUSIC ROOM.

and the lockers get thus only temporary use, to hold the clothes that are locked up during the period of exercise.

A look at the plan will show the provision made for various athletic pursuits, including a rifle range in the sub-basement.

The Dining Hall comes next in importance. It stands alone as the principal feature of the east front. A dining room cannot, however, stand altogether alone. The consumption of food is an incident, occupying about three hours of the day, while all day long there is a hive of workers preparing and cooking the food, and cleaning up the mess that food leaves behind it. The basement plan shows the number and variety of the departments and appliances required by a first-class modern kitchen of this kind. All this busy life below ground reminds one somewhat of the hold of a ship, except that there is here no "overboard." We may see, in the spaces marked "dry garbage" and "garbage refrigeration," the care that is taken to meet this difficulty. It is needless to observe that white tile forms the wall linings of this department and that light and ventilation are, in spite of appearances, abundant.

Above this hum of things below stands the Dining Hall, in solemn dignity above. The oak of the roof and dado is left in its natural color. The roof, which was up first, is already a little deeper in tone than the dado. It would have degraded the oak to stain it, but age will improve its color. At the present time when the hall is lighted up, the harmony of the lighted tracery and the roof is exquisite. The scale of the tracery in proportion to the window opening is perfect; and the heavily leaded quarries of glass are part of the scale. The view looking north, towards the end opposite to the high table, gives the best idea of the beauty of the windows. The same harmonious proportion is to be seem in the Faculty Union dining room, which occupies the gallery on the west side of the hall and is shown on the second floor plan. It will be seen that the windows of the gallery are on axis with the windows of the hall; and, on the east side of the Faculty dining room, the opening is the same as that of the hall, while on the west side the opening is much smaller; yet there is no impression given of a change of scale. The groining carries over the spacing to the gallery windows, and the long narrow windows compose with the groining in a delightful way.

It is worth noting at this point that the chandeliers throughout the building are not, as so often, an injury to the design, but are actually a help. The so-called "sanctuary lights" of the Faculty Union dining room are a case in point. The eye is pleased to dwell, not only on the perspective effect these pendants give, but on the

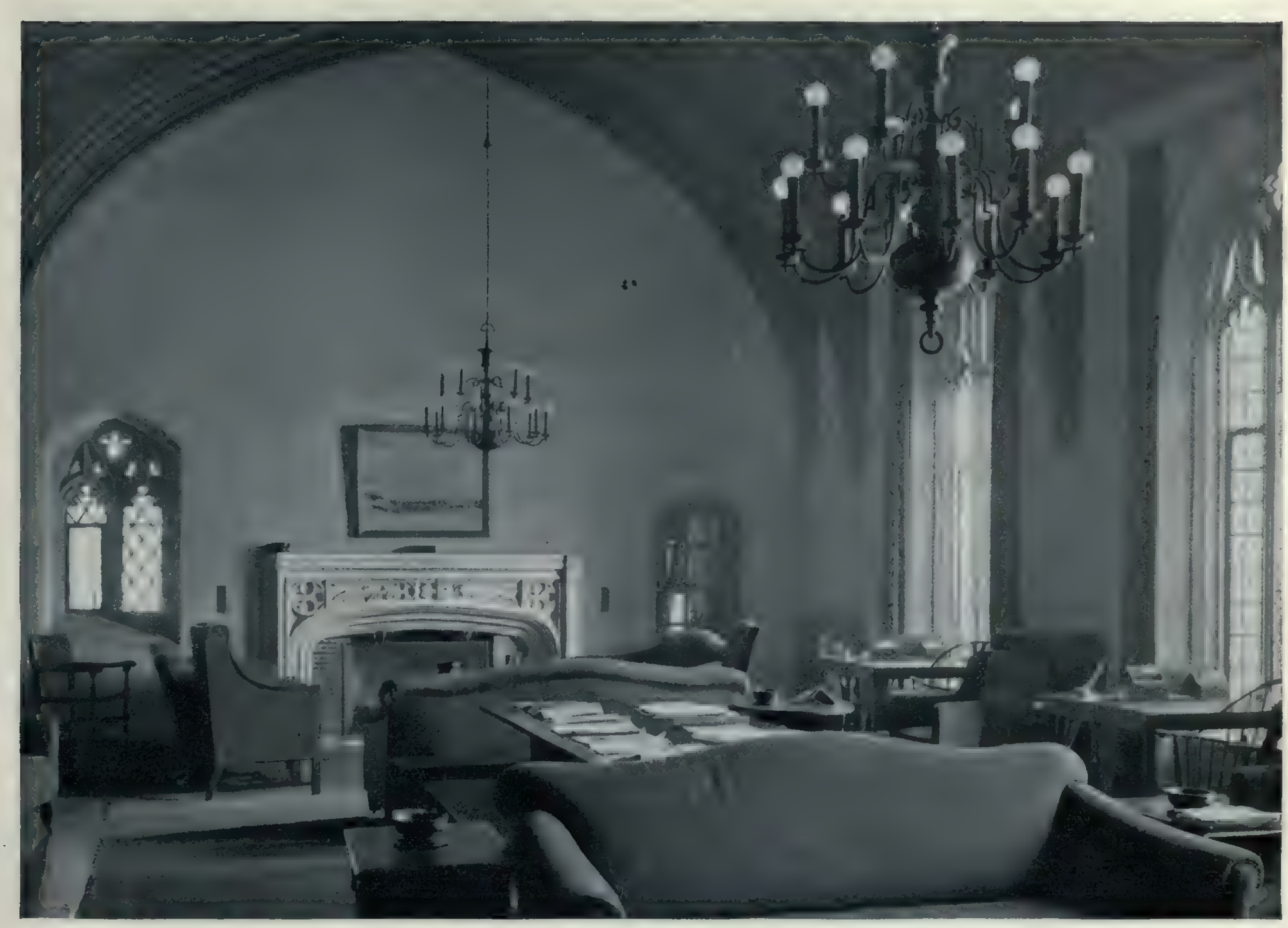
READING ROOM.

pendants themselves. It is the same with the lighting of the hall; the beautiful effect of the lighting at night, spoken of above, is helped rather than hindered by the beauty of the pendants that give the light. These fixtures, it is a pleasure to know, are of Canadian design and manufacture.

READING ROOM INGLE.

There are two remarkable features of the Hall which may require explanation. The heraldic panels, which are to be seen at each end of the hall, are in reality a memorial of the war. They display the coats of arms of the universities of England, France, Italy and the United States. The idea was conceived early in the war, before the United States came in, and there were then just enough coats of arms to fill the top panels of the dado all round the hall. Then came in America and upset everything. The painted panels have to be massed at each end somehow. This necessity, at any rate, brings the panels nearer to the eye, so that Mr. A. Scott Carter's beautiful work on them in paint and gesso may be studied the more easily.

The upper member of this proposed colored topping to the dado, a frieze of painted lettering below the cap, has survived the alteration in the scheme. It is a pas-



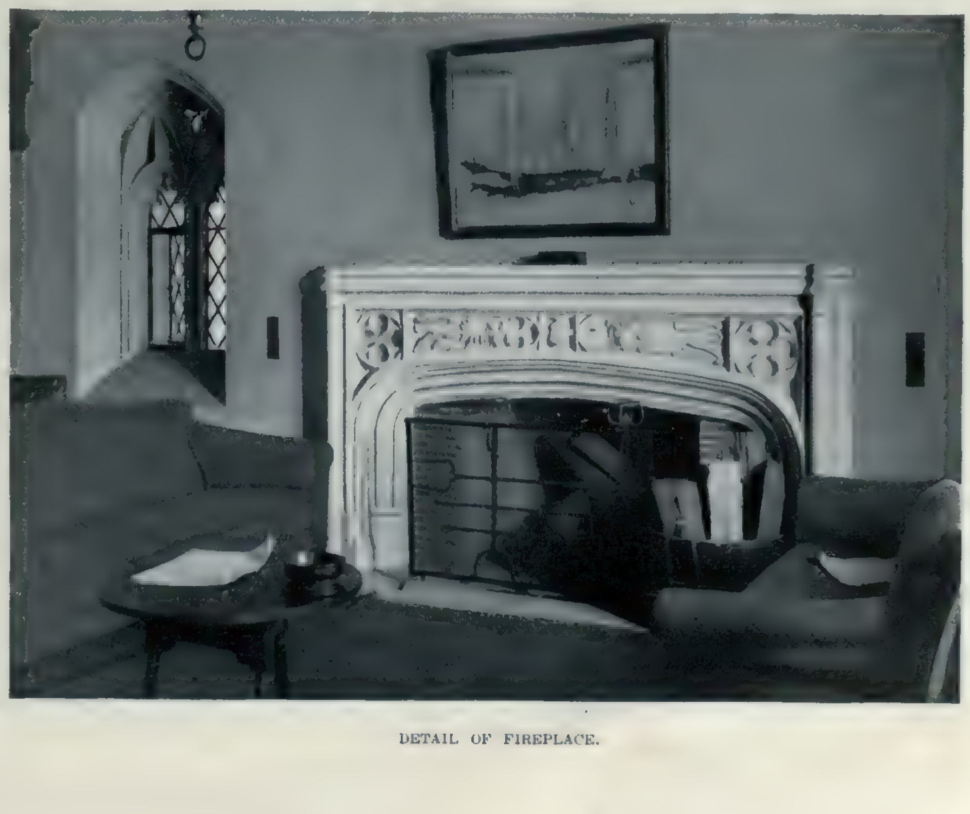
FACULTY UNION COMMON ROOM.

sage from Milton's Areopagitica which extends all round the Hall and envelopes the occupants in noble thought.

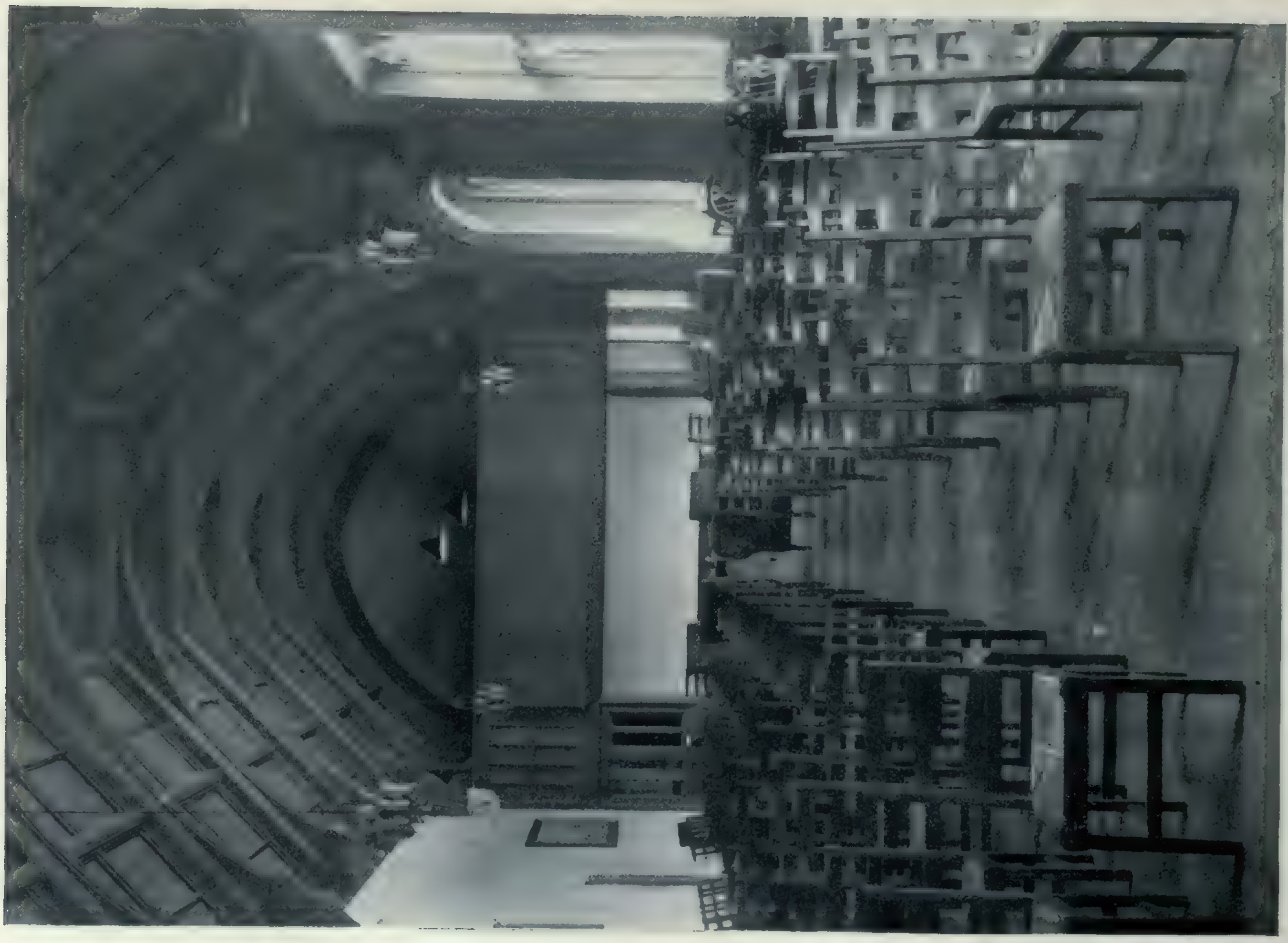
The other remarkable feature is the stone staircase which projects into the Hall at the upper end and connects the High Table with the Faculty Union Common Room. It is a stone stair with a vaulted ceiling, and exhibits some marvellously delicate stone cutting on the exterior. The entrance to it is to be seen in the cut of the Faculty Union Common Room on the right hand side of the fireplace.

There is another staircase of the same kind at the other end of the hall. This, which leads to the serving room of the Faculty Union dining room, does not project into the hall but into what is called on the plan the lower gallery. The cut of it, called Stone Stair of Lower Gallery, shows an interesting bit of original mediævalism from Mr. Sproatt's hand, in the miniature tower which runs through the handrail string under a canopy.

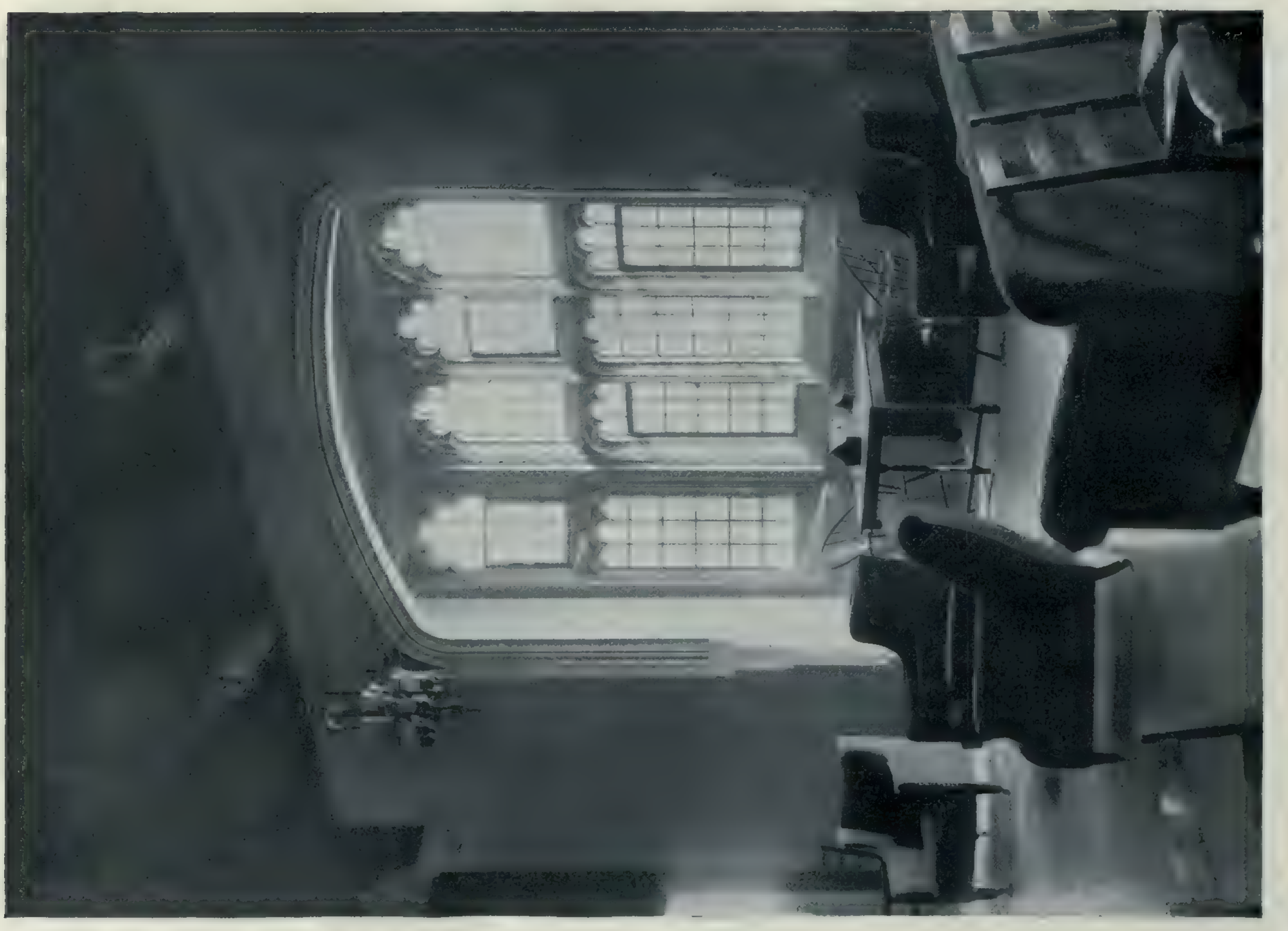
This Lower Gallery is a gallery only in the parlance of architectural history. It is on the ground floor, too wide and dignified to be called



DETAIL OF FIREPLACE.



LECTURE ROOM.



LECTURE ROOM BAY.

HART HOUSE, UNIVERSITY OF TORONTO

SPROATT & ROLPH, ARCHITECTS.

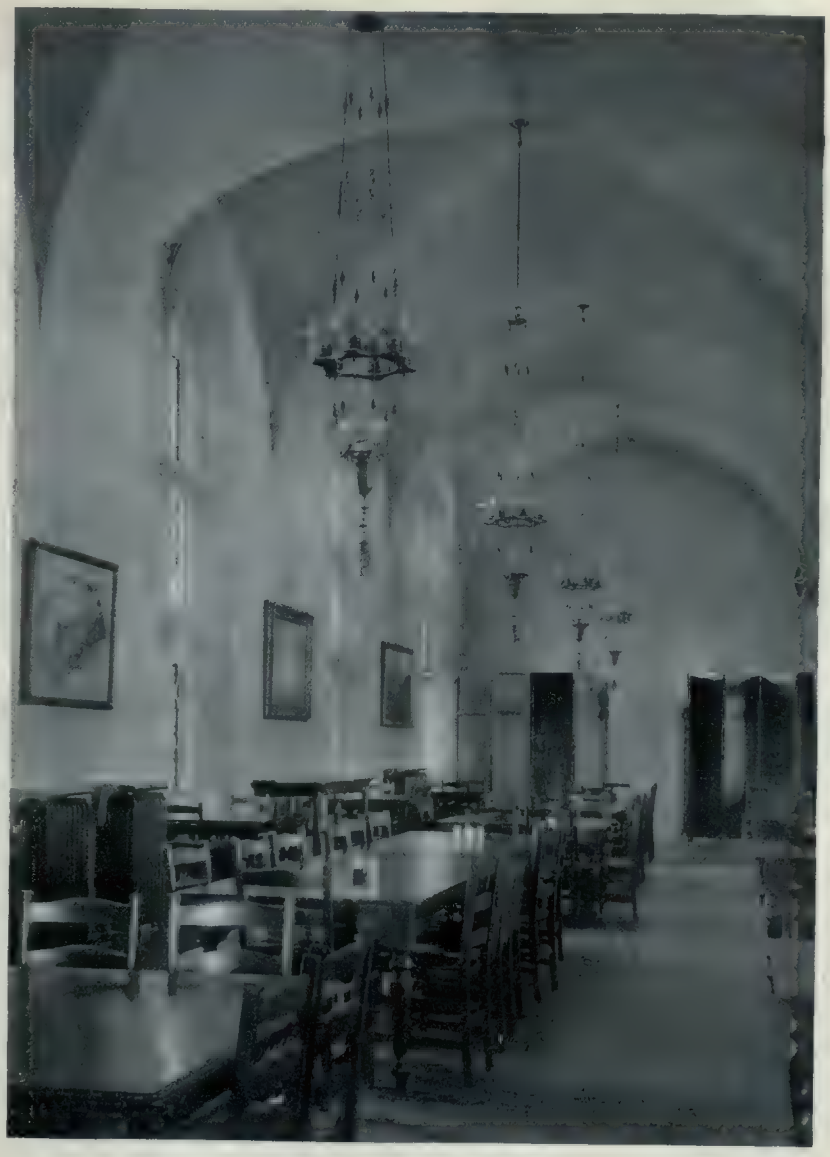
a passageway. It is, in fact, a lobby to the Hall, and has, besides its own beauty, the advantage of looking upon the quadrangle in the middle of the building. At the present time, when the grass in the quadrangle is green, and the doors to the south are open as well as the passageway on the west, there are beautifully pictorial views to be seen looking from the centre of the gallery in either direction.

The quadrangle grows grass with great success upon the roof of the theatre which lies below. The lower area on each side of the grass plot is devoted to pavement lights, which give a brilliant lighting to the corridors on each side of the theatre.

It is a question whether the theatre is not the most wonderful piece of planning in the whole building. In neither the theatre itself nor in its approaches is there any suggestion of its subterranean position. The vaulted ceiling of the theatre springs low, but rises sufficiently to give the stage all the height it wants. The appointments of the stage, under the direction of Mr. Roy Mitchell, the theatre director, are as perfect as the latest knowledge can make them. Mr. Mitchell will have all necessary facilities for accomplishing his interesting function of creating intelligent audiences for the theatre in Canada.

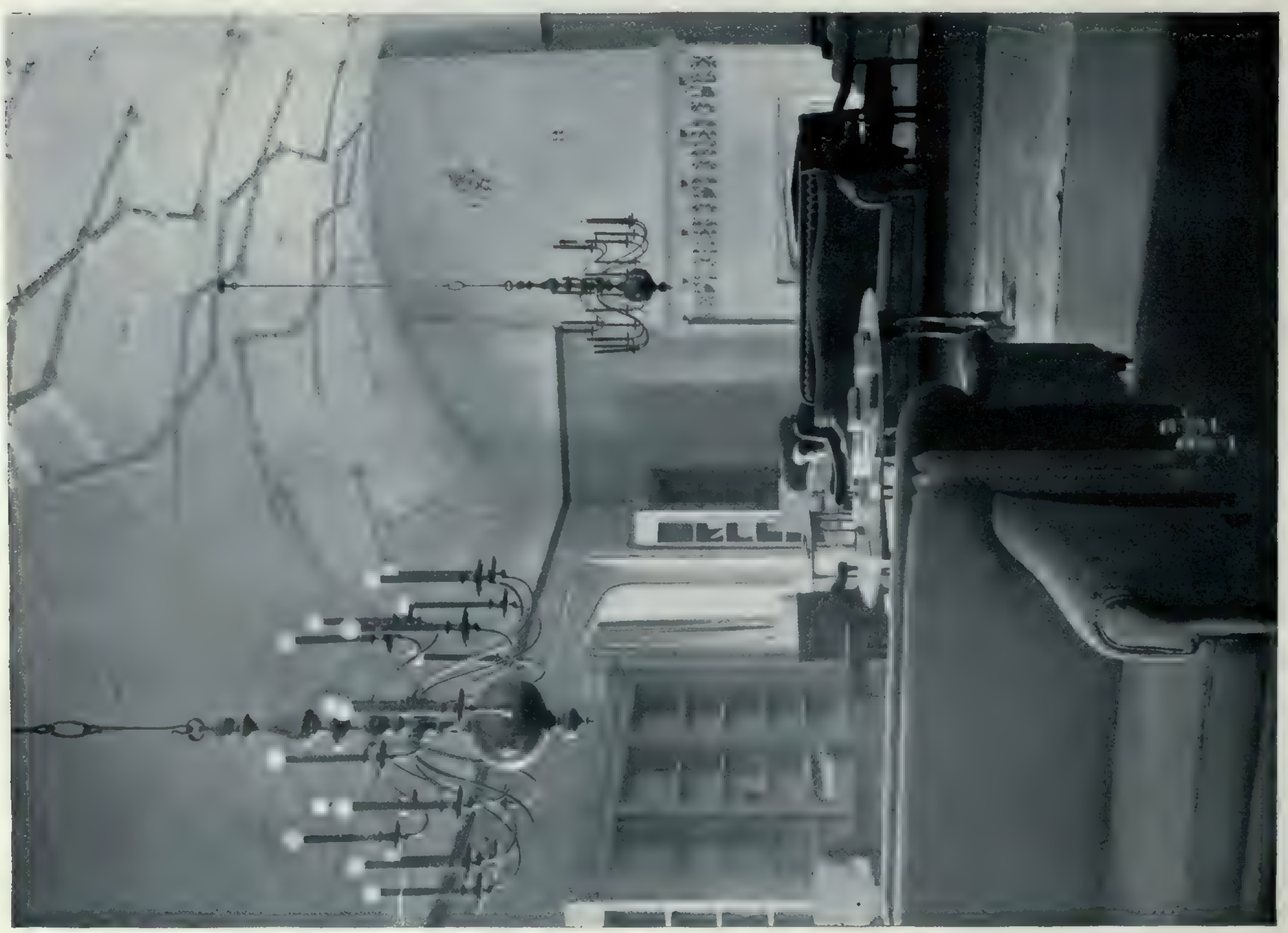
There is a wonderful amount of room behind the scenes, in the way of dressing rooms, working rooms and a green room, called "Long Room" on the basement plan. The cut entitled Theatre Promenade, representing what is called on the plan the foyer, gives some idea of the spaciousness of this part, but does not fairly represent its beauty. The "black and gold" marble trim, for the foyer and the pretty little passage which leads to it from the entrance, has the effect of touching the design with richness.

The chapel is not intended to compete with Convocation Hall as a place for holding general services or preaching sermons. It is a small room, but has considerable dignity, due mainly to the scale of the windows. The penetrations for the windows are repeated along the inner wall, and give interest to the ceiling. The woodwork is of oak-filled white, and the effect of the whole is a little on the white side at present. If the panels over the Communion Table were to be painted in proper subjects, and the room touched elsewhere by color—by the right hand—there are possibilities of wonderful beauty.

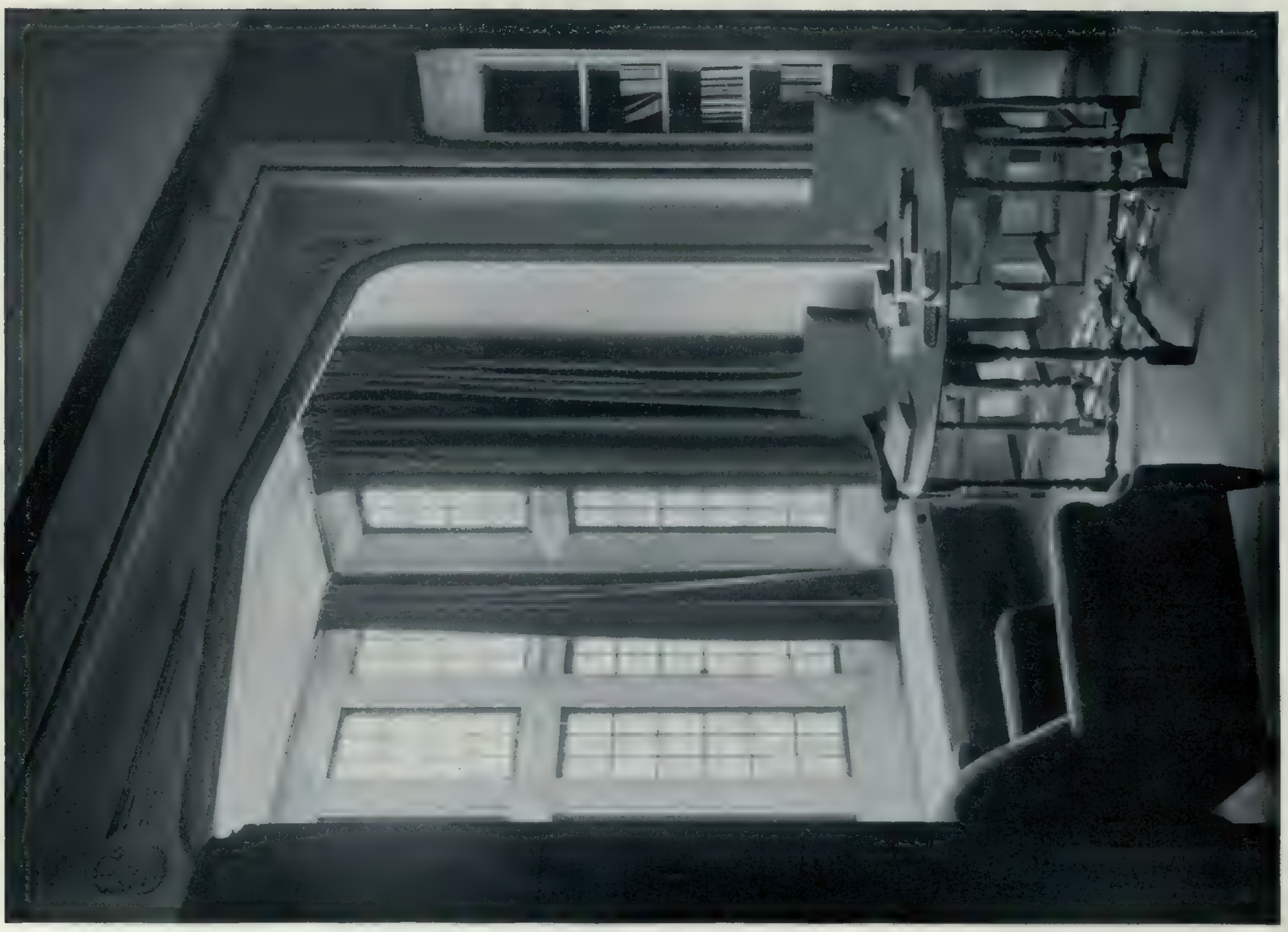


FACULTY UNION DINING ROOM.

How can one do justice to the rest of the building in the remaining space that is available. Fotunately there are, in this number of Construction, good cuts of the principal rooms, and complete plans to study in connection with them. The common rooms and entertainment rooms are ranged along the two principal fronts and have a place in the sun. Their extent invites the breadth of treatment that gives such dignity to the southern front. The large rooms are in the upper floor where they can be given height. The roof of the building is their ceiling and, except in the case of the library, the roof timbering makes their finish, all similar but different in detail. The music room, which is in the western wing, is somewhat lower than the others, and has the charming effect of a Tudor gallery. The roof, in this case alone, is of British Columbia cedar. It is untouched by a finish



LIBRARY.



LIBRARY BAY.

HART HOUSE, UNIVERSITY OF TORONTO

SPROATT & ROLPH, ARCHITECTS.

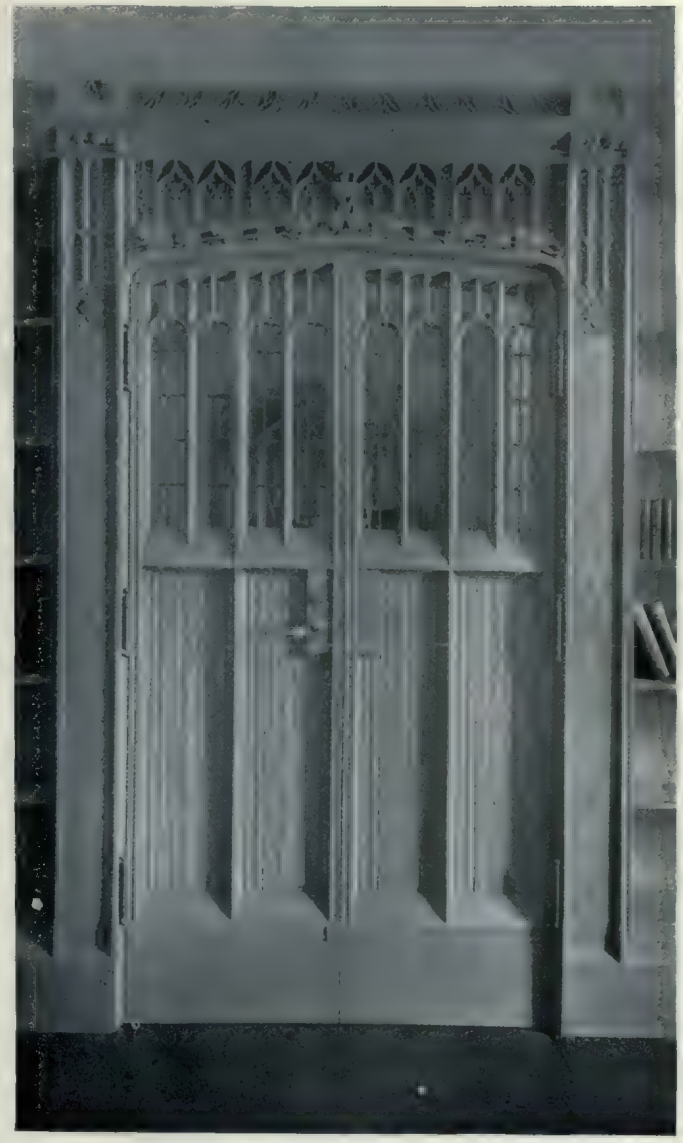
One advantage of the lower roof is that the carved stone corbels are brought nearer to the eye. Mr. Johnson, the carver, has the mediæval conception of carving, and his chisel has the Gothic touch. It is not that his designs imitate any ancient model, but that he has the same playful fancy and freedom of expression, and, if an appearance of "joy of creation" is the evidence of an artist at work, the evidence is to be seen in his corbels throughout the building.

The flooring of these rooms is worth mentioning, for it has something to do with the harmony of scale that is part of their beauty. The flooring, of oak, has boards that are, comparatively to the trade idea of flooring, wide. The boards are pinned with oak pins. The cut of the lecture room shows this flooring best.

All the halls, and the dining hall also, are floored with travertine, because of its noiselessness. The stairs are of stone.

The two great stairs are similar. They share among other things a two-storey bay window looking north into the quad. The upper floor of the staircase crosses the bay as a gallery, with a handrail. This device, which adds to the beauty of the stair hall, greatly increases the light; and the stairs are well lighted.

Here we may let ourselves out, having first descended, for our coats, to one of the cloak rooms which is situated at the bottom of the south-east stair, to be in readiness for public receptions in the dining hall. Everything is thought of in this building.



LIBRARY DOOR.

Mechanical Equipment of Hart House

By Walter Kay.

IN such a building as Hart House, forming a social and athletic centre in University life, the matter of mechanical equipment necessarily represents an important installation. When the building was first proposed the principal cities of Canada and the United States were thoroughly searched for ideas, the very best of which only were retained and incorporated in the plan of the building.

The plumbing fixtures are in themselves worthy of individual description, but lacking space only the outstanding features can be touched upon. The showers and douches—a very important part of the equipment of a building of this type—are of the latest design and with their marble enclosures present a very fine appearance. The system of thermostatic control, whereby the temperature of the water to all showers is automatically regulated, while not appearing on the surface contributes perhaps more than any other feature to the perfect operation of the equipment.

The lavatories throughout with their complete equipment of fixtures of solid porcelain, fine marble work and highly polished terrazzo floors, denote both in the materials used and workmanship a most satisfactory result. One feature of the installation is that with the exception of the urinals, all fixtures are supported from the walls, and on entering the lavatory one is immediately impressed with the entire absence of piping through the floor, so characteristic of ordinary installations. This not only contributes to the appearance of the lavatories, but makes them more sanitary in character. At convenient points throughout the building, especially designed porcelain drinking fountains furnish filtered drinking water at the pressing of a button. The hot water for the plumbing fixtures is drawn from a large steel storage

EAST COMMON ROOM.

tank located in the mechanical room. Along side this tank is a steam tube hot water generator specially designed with brass tubes, on the loose coil principle, by means of which the water in the storage tank is kept heated. A thermostat in the storage tank connected to a regulating valve in the steam line to the generator, permits the temperature of the water to be maintained at any desired degree.

The swimming pool equipment which represents the ultimate in apparatus for this purpose was only selected after a thorough investigation of all existing systems, and is such as fulfills its function in a positive and efficient manner. To start up the system the pool is first filled with water from the domestic hot water storage tanks to the desired level and then by means of a circulating pump the water is drawn from the tank, passed through the filters to remove all suspended matter, thence through the heaters and back to the pool. The heaters which are of the steam tube type are fitted with thermostatic control on the steam supply to regulate automatically the temperature of the water going to the pool. All of this equipment, which is located in a separate mechanical room, is installed in duplicate, thus eliminating the necessity of shutting down the system for cleaning or repairs and ensuring continuous operation under practically all conditions.

Floating scum, which could not be all drawn off to the filters, and heavy sediment lodging on the bottom of the pool had long been a serious problem in swimming pool design. Here it is successfully overcome by means of a suction cleaner which removes both scum and sediment completely and discharges it to the sewer.

Although the Hart House is as nearly fireproof as any building of its type can possibly be, no precaution for the safety of its occupants is omitted. All through the building at convenient points in the halls and corridors are located fire hose equipments, and like many other features in the building, both the recessed cabinets and the hose racks were especially designed for this installation.

The touch of good engineering is shown in lay out of the various domestic water mains. All mains, both hot and cold, supplying the various sections are taken from a header in the mechanical room, each branch being fitted with

LIBRARY INGLE.

a controlling valve to which is attached a numbered brass tag. By consulting a chart which is suspended near by, the engineer can shut the water off from any portion of the building at will.

In the rubbing rooms, marble tables are installed suitable for both dry massage and shampoo work. In this section of the building there is also located a drying room, containing a sterilizer for sterilizing the bathing suits, and a specially designed dryer for drying them. On the upper floors are located several very completely equipped bathrooms for the use of the professors and staff.

HEATING EQUIPMENT.

Direct heating of the building is accomplished by means of steam radiators operating on a vacuum system. The steam supply to the building is brought from the University central heating plant to the Hart House mechanical room in both high and low pressure mains. The low pressure main is connected directly to the header supplying the heating system, which is located in the mechanical room. The high pressure main is also connected into the heating system through a regulating valve which ensures a constant supply at all times. Each section of the building, as well as the various indirect heating units in connection with the ventilation system, is supplied by a separate main direct from the mechanical room where it is fitted with a controlling valve, and by which means the steam supply to any part of the building may be regulated at will. The condensation from all radiators and coils is drawn back to the mechanical room by means of motor driven vacuum pumps from which it is discharged to a receiving tank located near the ceiling. Here the air is separated from the condensate, and vented off to the atmosphere, the condensate itself passing by gravity through a recording meter directly into a second receiver. This receiver is connected to a duplex unit of motor driven centrifugal pumps, which is controlled by a float switch in the lower receiving tank. When the water level in the tank rises to a given height the pump is set in operation discharging the water of condensation back into the main return line leading to the power house.

No pipes are exposed in any part of the building; the steam mains which run in the basement are all located in concrete tunnels with openings at fixed intervals to give access to the various drip traps, etc. The temperature of the mechanical room is kept down and the appearance improved by a thorough system of pipe insulation. All high pressure steam mains are covered with magnesia covering and all low pressure mains here and throughout the building with asbestos covering in canvas with brass bands at regular intervals. All hot water heaters and storage tanks are similarly treated, and their neat white appearance lends an attractive touch to the whole installation.

THEATRE FOYER.

VACUUM CLEANING SYSTEM.

The ease with which the building is cleaned and maintained in that condition is due to the highly efficient vacuum cleaning equipment which is installed. The vacuum producer, which is located in the mechanical room, operates on the turbine principle, and is equipped with a separate tank which acts as a dust receptacle. A system of piping extends throughout the building, with outlets located near the floor level in sufficient numbers that every portion of the building may be reached with the hose equipment furnished for each floor. It altogether represents a most complete installation in which every detail of the system has been carefully worked out.

THEATRE VIEW.

VENTILATION.

The problem of furnishing an adequate supply of fresh air, and the constant removal of foul air was one which received the most careful consideration, and which resulted in the installation of a ventilating and air conditioning equipment remarkable for its completeness and efficiency in operation.

There are three individual supply units located in a central fan room, one for the swimming pool, one for the theatre and one for the dining hall. The theatre and dining hall supply units are identical as to equipment, although varying slightly in size, each consisting of a special width, full housed, multiblade fan direct connected to electric motor. These fans draw air from out of doors, first through a series of steam coils to temper the air, then through an air washer where by a series of sprays and metal eliminator plates all dirt and dust is removed, and finally through a second series of steam coils where it is heated to the desired temperature and discharged through a system of metal ducts to outlets located in the various rooms.

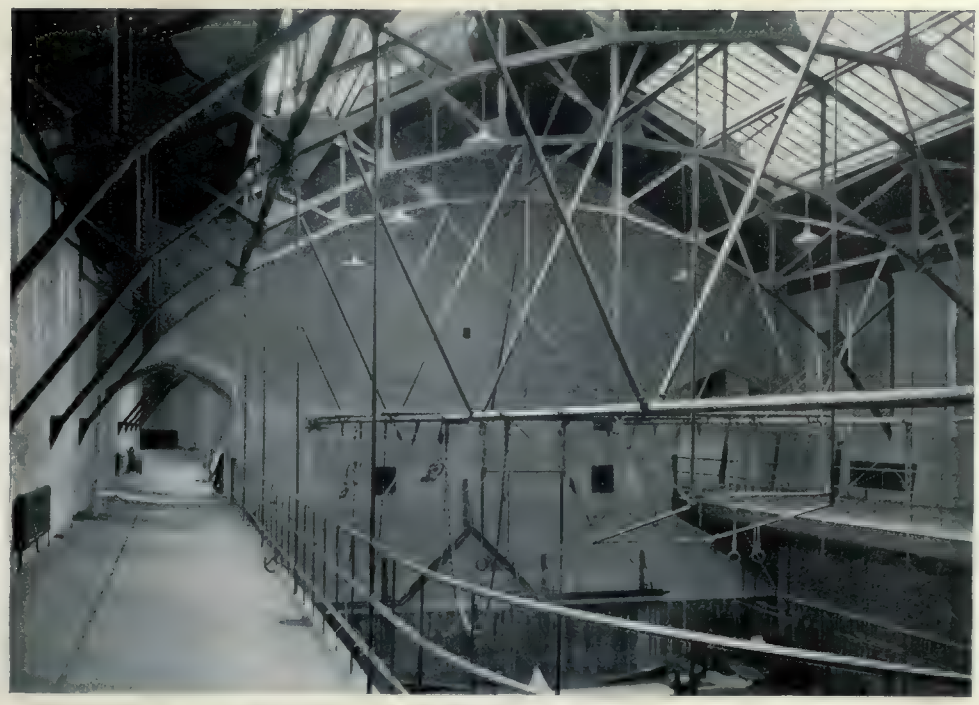
GYMNASIUM CORRIDOR.

By an ingenious device in the air washer the humidity of the air supply to the building is maintained at a constant point, regardless of the humidity of the outside atmosphere.

The swimming pool supply unit is designed along similar lines to these with the exception that the air washing apparatus is eliminated.

A special feature of the equipment for the theatre is that the fresh air is supplied through outlets located under the seats and in the aisles and drawn off from the upper portions of the room, the current of the air always being in an upward direction. This eliminates the feeling of a draft sometimes present in a well ventilated room in which the current of air is from the back to the front.

To exhaust foul air, smoke, and kitchen odors, six ventilating units have been installed, individual units exhausting from the swimming pool, the theatre, the billiard room, dining room, kitchen and the servery at a combined rate of seventy-five thousand cubic feet per minute. These units are all designed along similar lines although differing somewhat in size, and consist of a full housed multiblade fan connected directly to electric motor. The foul air is taken from convenient points in the walls or floors of the several rooms and drawn to the fans through separate systems of metal ducts and discharged to the atmosphere at a point sufficiently remote from the fresh air inlet to avoid any possibility of the contamination of the fresh air supply.



GYMNASIUM RUNNING TRACK.

These various equipments deliver into the building forty-two thousand feet of pure warmed air every minute and exhaust therefrom foul air, smoke and kitchen odors at the rate of seventy-five thousand cubic feet per minute, and maintain a standard of purity in the air of the whole building not excelled by any building of any type in the Dominion of Canada.

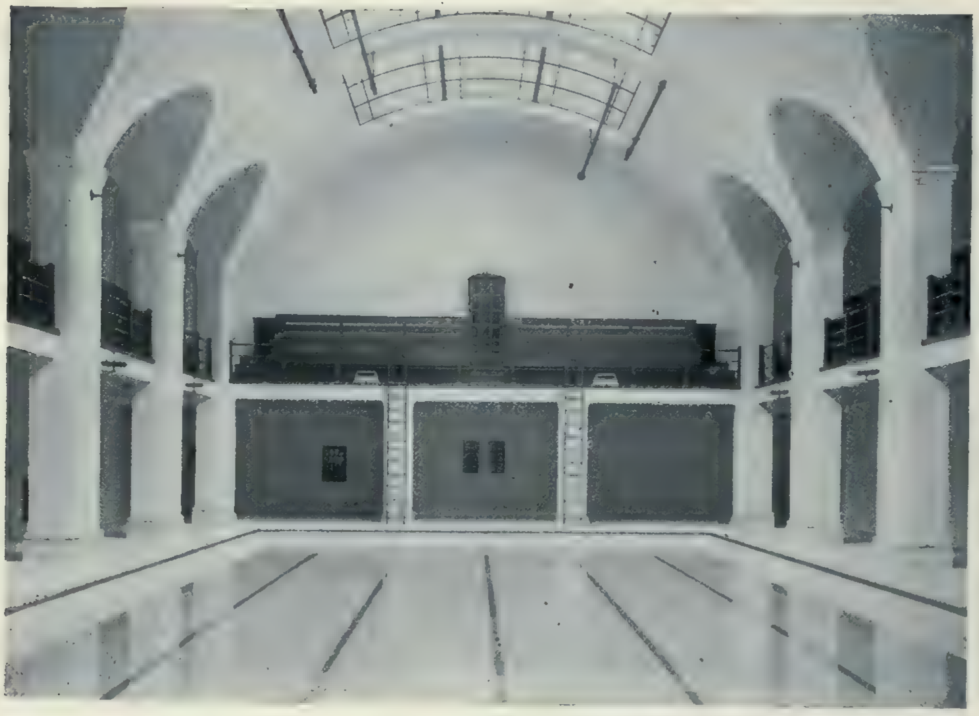
Hart House Theatre

The underground theatre of Hart House was an afterthought incorporated into the scheme of the building as originally proposed. It was suggested by a depression in the site formed by an old creek bed in which in the early days the upper classmen of the University used to duck the freshmen. By turning this to advantage the architects have not only succeeded in developing a most unusual and interesting feature in their plan, but one which adds to the function of Hart House as a students' social building.

The designing of the auditorium, which is immediately beneath the ground level of the quadrangle, involved an important engineering problem which was described in detail in the May issue, 1914, of Construction. The distance between its side walls is fifty feet, which owing to the nature of its purpose could not be divided by intermediate supports. The solution naturally suggesting itself for the support of a roof of the kind was the use of steel trusses. These, however, it was found, would be far too deep for the available head room, and also that steel or concrete beams would prove impracticable. It was necessary that the ceiling height should approach as nearly as possible to the ground level of the quadrangle above, and this led to the adoption of a concrete arch of elliptical form with the springing line well up on the side of the wall.

The abutment is made in the form of a hollow rectangle. The two vertical sides are pilasters

GYMNASIUM.



SWIMMING POOL.

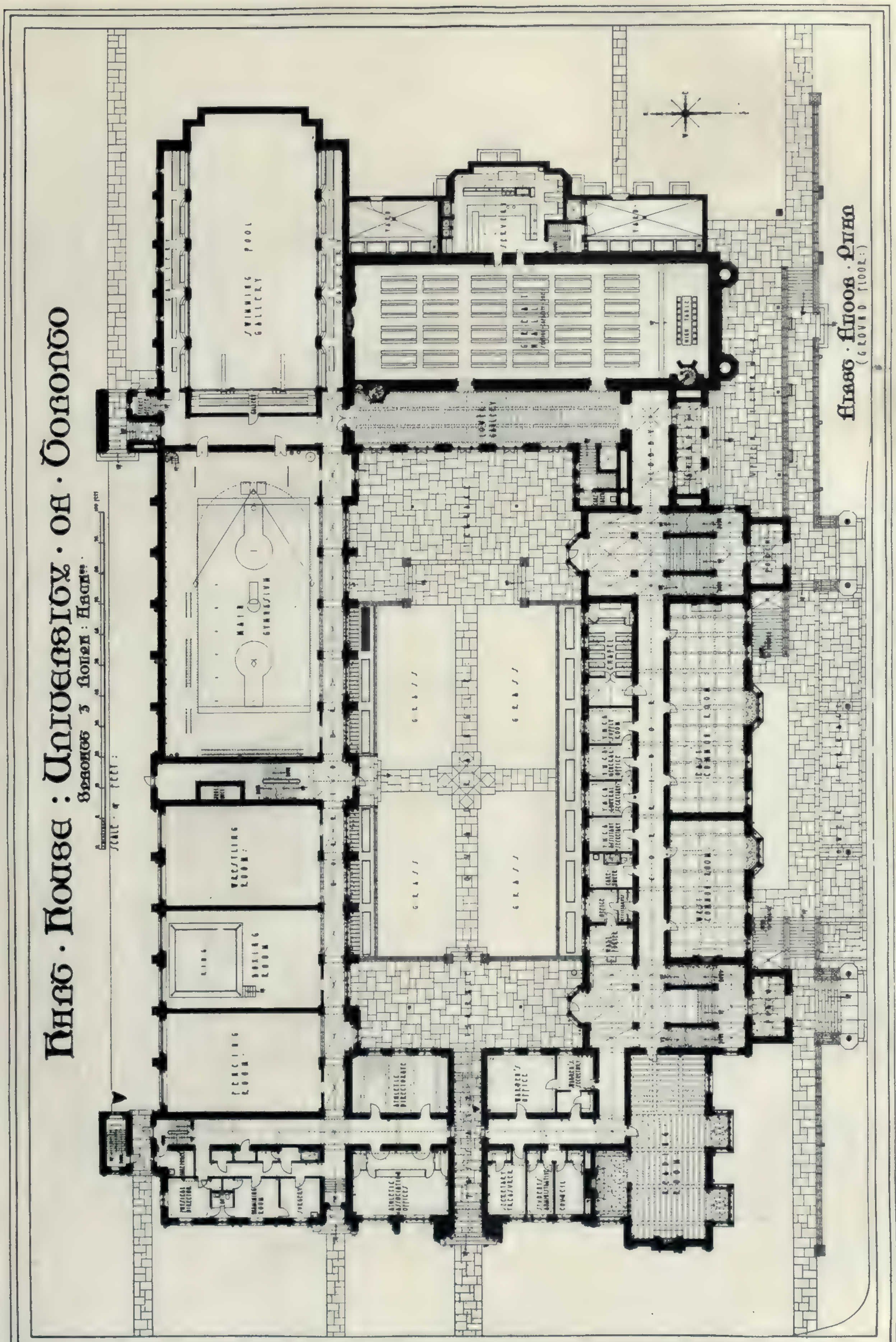
in the walls in either side of the corridors which parallel the auditorium. The top is the arch over the corridors and the bottom is the footing. The four sides and corners of this rectangle are reinforced so heavily that the line of thrust from the arch can pass across and through it without causing greater stresses in the concrete or reinforcement than those used in ordinary practice. In this way the line of thrust is brought through the corridors in diagonal diection and passes into the rifle range at a distance only slightly above the floor. This is assisted in no small degree by the fact that the load on the walls on both sides of the corridor tend to turn the line of thrust more sharply toward the vertical. In spite of this, however, it passes entirely outside the rectangle as it would ordinarily be constructed. In order to insure stability in the footing of the wall it was necessary to extend them well under the floor of the rifle range as cantilevers and to pour them as units with the foundation under the rectangle. The cantilever reinforcement is very heavy.

The provision of the Toronto building by-law increased the difficulty of the design of this arch. Safe stresses according to usual practice were secured in this design by an arch three feet wide. In order to meet the requirements of the building by-law, however, it was found necessary to widen the arch to five feet. This incrase of forty per cent. in the weight of the arch had the natural effect of greatly increasing the horizontal thrust at the spring point, and consequently make a second solution of the abutment necessary. This second solution, on account of the greater horizontal stresses involved, was considerably more difficult than the original solution.

Utilize Canada's Resources

Canadians are justly proud of their structural timbers—red pine, western soft pine, tamarack, hemlock, Douglas fir, etc. That the qualities of these timbers may be well known to Canadian builders, so that the importation of no better or even inferior timbers may be reduced the Forestry Branch of the Department of the Interior has issued a publication known as Bulletin No. 59, "Canadian Woods for Structural Timbers," giving the facts about these woods. This has been followed by Bulletin No. 60, "Douglas Fir: Its Mechanical and Physical Properties," which deals with this wood from every point which is of interest to the structural engineer and builder.

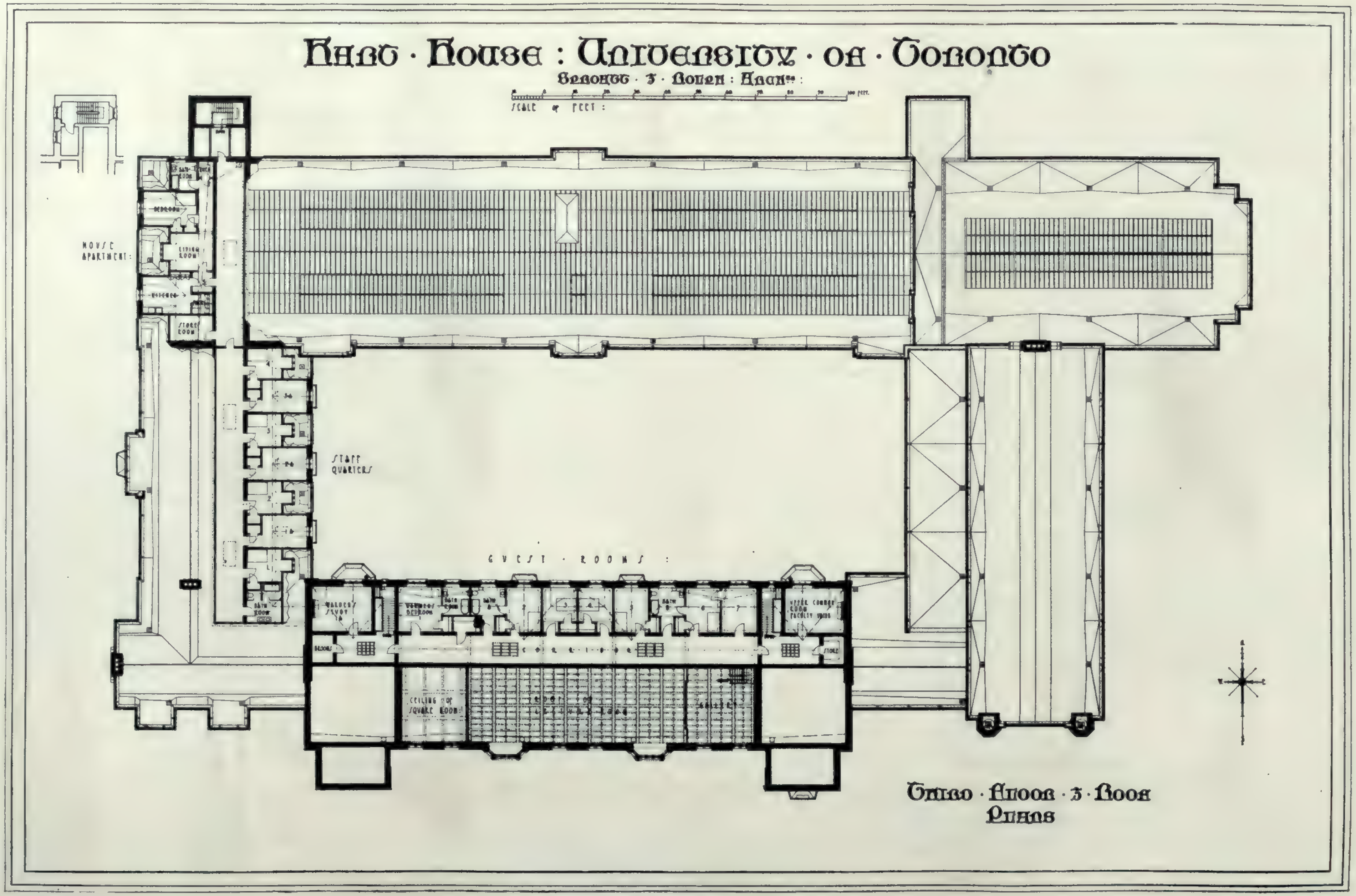
BILLIARD ROOM.



GROUND FLOOR PLAN.

HART HOUSE, UNIVERSITY OF TORONTO

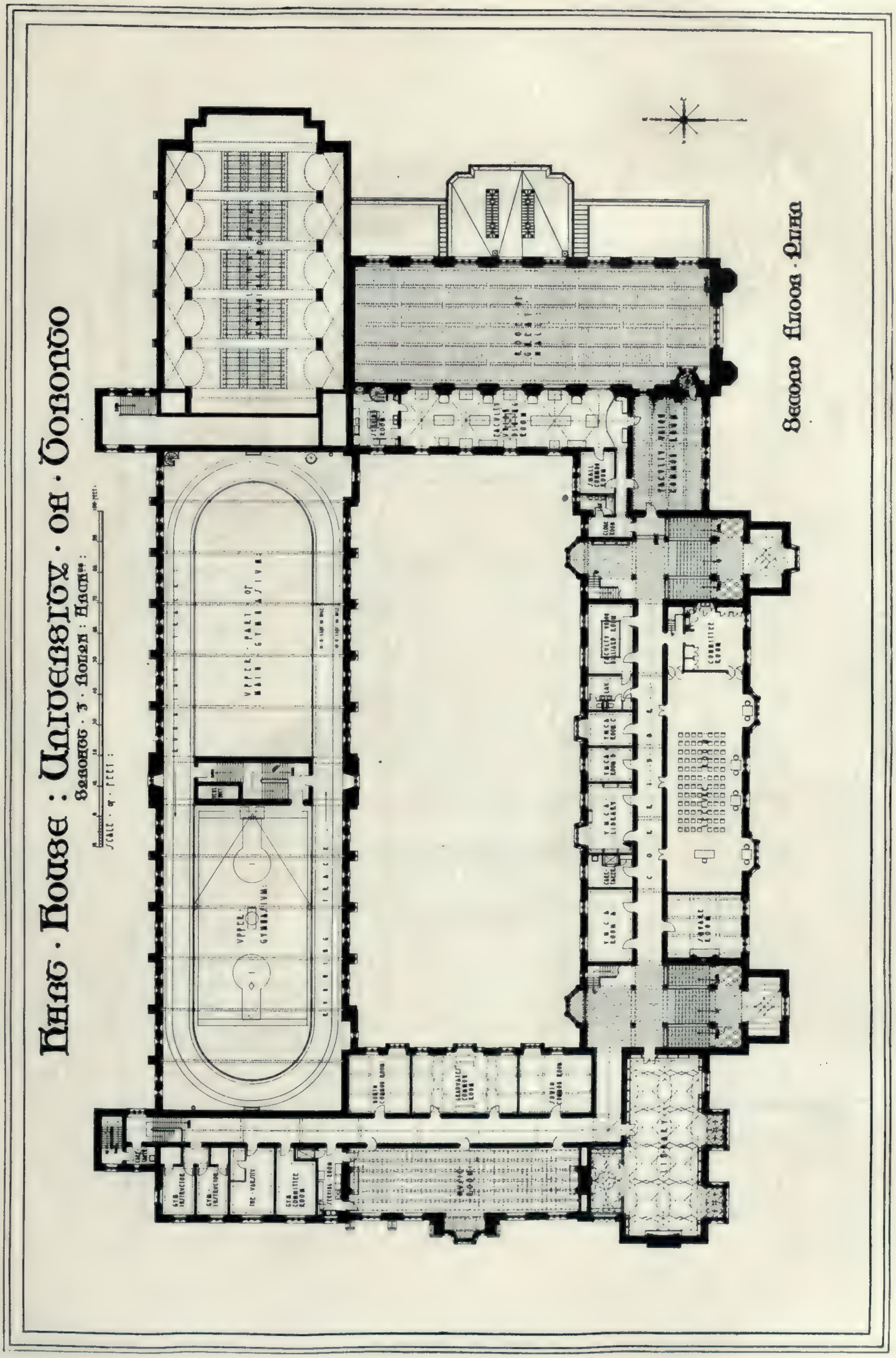
SPROATT & ROLPH, ARCHITECTS.



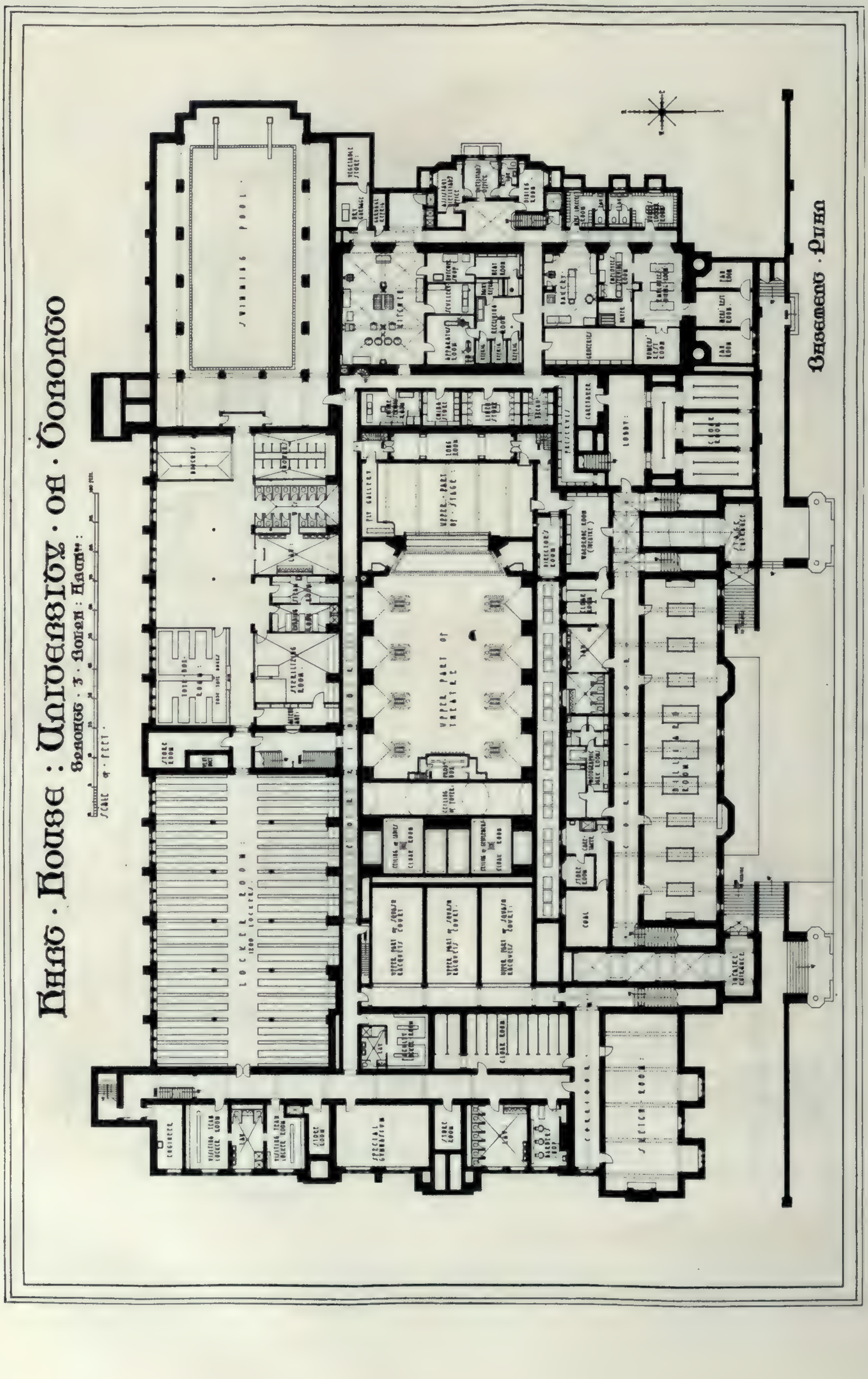
THIRD FLOOR PLAN,

HART HOUSE, UNIVERSITY OF TORONTO

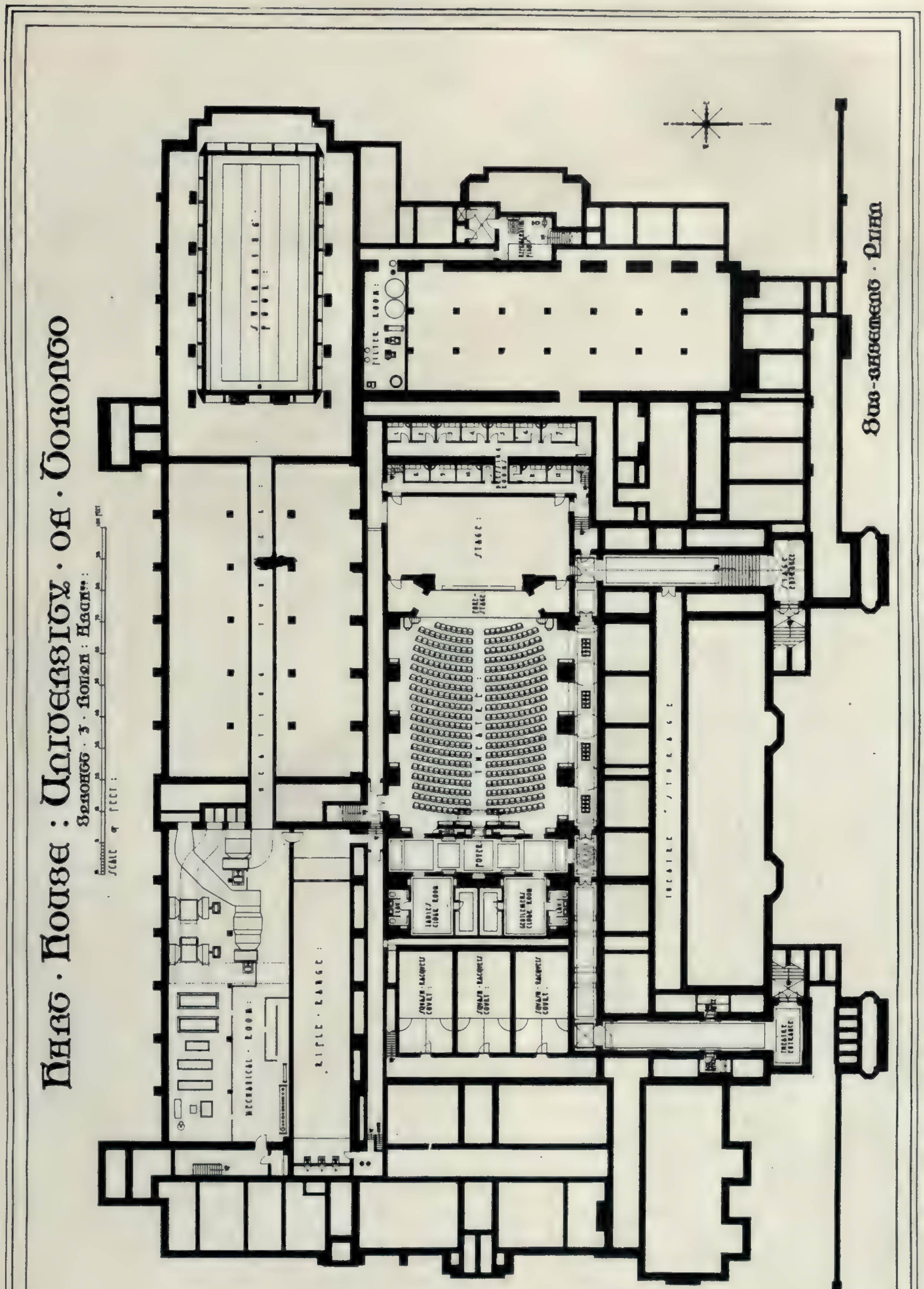
SPROATT & ROLPH, ARCHITECTS.


Hart · House : University · of · Toronto
Sproatt · & · Rolph : Archts :
Scale · of · Feet :
Second Floor Plan
Upper Part of Main Gymnasium
Upper Gymnasium
Running Track
Library

SECOND FLOOR PLAN,
HART HOUSE, UNIVERSITY OF TORONTO
SPROATT & ROLPH, ARCHITECTS.



BASEMENT PLAN.
HART HOUSE, UNIVERSITY OF TORONTO
SPROATT & ROLPH, ARCHITECTS.



SUB-BASEMENT PLAN.

HART HOUSE, UNIVERSITY OF TORONTO

SPROATT & ROLPH, ARCHITECTS.

Concrete, Its Use and Abuse*

By Irving K. Pond, F.A.I.A.

I HAVE written so much abstractly on architecture and architectural principles that it is good again to get down to hard and fast matters and fix my hypotheses in the concrete. I say "again," for many years ago as chairman of the Committee on the Allied Arts of the American Institute of Architects I was the author of a widely circulated report from that Committee dealing with concrete as a medium of architectural expression. I have had but slight occasion to put into practice the theories I then advanced, but I have continued to hold, and still maintain them.

Since that time the use of concrete in building operations has grown apace and enthusiasts and specialists have arisen to scatter their words and their works broadcast—sometimes, though not always, the words being more attractive than the works—sometimes the words and works alike bordering on the grammatically atrocious—as, for instance, when the beauties of cast rock-faced-concrete blocks have been urged and the monstrosities themselves have made pitiable what otherwise might have been semi-respectable structures—"semi," mind you, not "wholly," respectable; for the taste which could advocate and incorporate into its product such base imitations could not create or fashion a thoroughly respectable structure. Some two years ago while acting as chairman of a board to adjust, and settle perchance, jurisdictional differences between the carpenters, the architectural iron workers and the sheet metal workers of Chicago, I suggested facetiously that the fabricators of imitations should be penalized by giving over to the trades whose products were imitated the erection of all such imitations. Thus stone masons should erect all tin fabrications simulating stone cornices, architraves or entablatures, and do plastering where plaster simulated Caen-stone—one might put it "con"-stone—on walls and in vaulted ceilings. My pleasantry was met with hearty and strenuous disapprobation—each trade wanted to tell its own little lie and to reap the benefits which each felt certain would accrue to it in a world so slightly endowed with the elements of sincerity or of good taste.

So my first item of advice, if I may be permitted to offer advice to a body of men interested in the development or handling of a comparatively new and altogether worthy building material, is to treat the product with respect, to shun and scorn imitations, to recognize limitations, which attach to all materials, as well as to all men, and to work within those limitations. This is not saying that because a thing has been done, and frequently and appropriately done, in one material it shall not be done in another or a new material which may be employed with equal propriety; however, the new material should not employ forms which are purely distinctive of the old, but should develop forms which inherently characterize the new.

What these characteristic forms may be is a subject for very searching study and analysis. Possibly through synthesis rather than analysis will the characteristic forms disclose themselves. So was it in the past with the old materials—so probably will it be with the new.

Now concrete is a material which lends itself to many kinds of manipulation. It can be cast, poured, pressed, assembled in the shop or on the job; it can be applied in liquid or in solid form to the work immediately in hand. So many are the possible methods of its application—such a diversity of means may be employed toward its legitimate ends that some of its enthusiastic sponsors see in it a panacea for structural ills and possibly for aesthetic building ills, a substitute for all previously employed building materials—excepting, possibly, door hinges—and a perfect end in itself. Therefore, it behooves those who can impartially survey the entire field to offer both warning and encouragement—encouragement in its legitimate use; warning against its too free employment, especially where other materials may better serve the conditions. The economics of the general situation favor concrete, and through this factor alone there may arise a tendency toward its too general employment; toward its substitution for other materials which, though perhaps costing more in mere money, satisfy the senses and better fulfill geographic and climatic conditions. The cheapness and ease of casting a flat slab of concrete has led certain enthusiasts to advocate the general adoption of a flat slab type of roof in any and all parts of the country (and ultimately of the world). It is advocated for a northern climate because it can very cheaply be made strong enough to hold a load of snow and ice. But that is not what a roof is for—it is to shed snow and ice. The flat slab roof is advocated for a southern climate because the overhang for shade is so cheaply procured. The shade is desired, but not at the expense of ugliness which results from unembellished overhangs—and concrete embellishments are expensive. The factors of ease and economy in manufacturing concrete slabs, whether to be applied vertically or horizontally, contribute to a "simplicity" which tends toward stupidity and to a barrenness which begets ugliness. Where the general form is stupid and ugly not much in the way of reclamation can be effected by proportioning of windows or application of superficial ornament. If the mass is interesting and appropriately conditioned, geographically and climatically, slight defects in details will not too seriously challenge the taste, but an ugly mass is fatal.

---

*An address delivered before the National Conference on Concrete Housing, recently held in Chicago.

In spite of the fact that the learned ones will point out that concrete was a favorite building material with the ancient Romans, and that traces of it are found attaching to Greece, Egypt and the ancient Orient, concrete as employed by modern Americans is a new material, the science and art relating to which are not fully developed. Much has been done to satisfy the conditions of its employment—much more remains to be done. The newness of an art, or the suspected newness of an art, is a sufficient cause for criticism or antagonism in the average American eye. We are the most conservative people as regards art and the arts on the face of the earth. We will not accept materials and methods on their merits and attempt to develop their intrinsic qualities or worth. Art is about the only line along which we are conservative, however; that is, we conserve very little along material lines—and we do sling dead art about recklessly and embalm its form in lasting and eternally reinforced concrete in which they appear more dead than heretofore conceivable. The fact that they are embalmed in a vital and vigorous material emphasizes the fact of death. There are those who claim that these dead forms are alive—but only to the dead do the dead live! Concrete is a vital material full of character—let us give it its vital forms.

Because concrete has for so long a time been poured into moulds or forms, and because of the coarseness of its ingredients, one of which was stone which could go through a two-inch ring, the earlier designers, and I fear there were architects among them, coupled in their minds concrete with crudity and coarseness of detail and, being dependent upon precedent, and knowing not where else to look, fell upon the crude Spanish detail and broad masses of the early Spanish Missions as representative of what best might be embalmed in concrete, and so Spanish missions distorted into bungalows and cottages and palaces spread like a rash over the face of the country. As technical and mechanical difficulties were overcome and processes refined, the rash itched to take another form of disease and turned into a classic fever, with now and then a touch of Gothic "pains" noted particularly in the traceries on solids and in voids. The fever still burns, the pains still grip. Expensive forms are built up and destroyed to produce effects which already, ad infinitum, ad nauseam, have been better achieved in stone. However, this is not always to be.

The waste entailed in the destruction of specially constructed and expensive forms has become apparent to many concrete users and exploiters, and their efforts to prevent the consequent loss, especially in case of the smaller residences and the houses with which this conference is more particularly concerning itself, has introduced an element which may well call for restraint in its application. For the sake of economy, forms are used and reused in close proximity. When such forms are not perfect in themselves and in utmost good taste, monotony in repetition becomes deadly, and woe is it to him whom cruel fate has condemned to inhabit a unit in an environment so constituted. Life and joy and self-respect must be absent from the dweller amid such surroundings. Even where the forms are charming and singly in good taste, repetition robs them of individuality and unfits them for occupancy by anyone possessed of character and personality. Individuality of character and personality are absolutely necessary in the units which go to make up the mass of a civilized and self-respecting society. Consequently another injunction, which I offer by way of advice, is to avoid wastage of forms—but even more to avoid the monotony which must follow the unrestrained employment of any "motif," ugly or charming. Introduce spice into life in the way of variety. The principle underlying this admonition is just as applicable to a mill town as it is to the most highly developed suburb. In point of fact, little or no distinction should be drawn between the mill town and the "swell' suburb. It should exist possibly only in the size of units; it should not exist in the expression of good taste and mental and bodily comfort. Perhaps I am getting ahead of the age and of the present topic. I hope not.

In spite of the manifold and varied means, methods, processes, applications, manipulations, textures, surfaces and colors appertaining to the use and employment of concrete as a medium of architectural expression and embodiment, I am not certain that I should advise its sole and unlimited agency in housing the activities of any one neighborhood or community. Indeed, I am quite certain that I should not so advise; and this not altogether on the ground of a needed variety, but that there are other materials which transcend even concrete as a medium of certain desired expressions of the human spirit in the art of architecture. And I should desire to see no community curtailed of, or denied, the right and power to express the best that is in it in the materials best adapted to that expression.

Thus marble, granite, iron, bronze, brick, slate, each one possesses inherent qualities or characteristics not translatable into concrete even through the agency of base and artificial imitation. In the matter of brick, for example, there is scale to the unit which relates the mass to human desire and experience in an intimacy possible with no other material, while in natural color and texture the range is boundless. But even with all that, brick needs other materials in its neighborhood for contrast and variety, purple-green of slate, soft white of stucco, weathered gray of timbers, with carvings and turnings, and craftsmanship which cannot be imparted by a mould, however exquisitely the surface be wrought by the modeler's hand.

I assume that as an architect I am expected to say that the only way to make concrete an accredited and acceptable building material adapted to all human material and aesthetic needs is to have its essence filtered through the alembic of the architectural profession or its representatives.

If you wish me to say it, of course I will—with reservations. Now the most stupid of anachronisms are perpetrated by so-called architects (they really are untutored archaeologists or, rather, grave-robbers), and the most blatant of modernisms, cut off from all context of history, have emanated from again, so-called architects (they really are unlettered sentimentalists). But I will say that the possibilities of concrete as a medium of aesthetic expression in building may best be apprehended by a sincere architect, with knowledge of modern social conditions and tendencies, working in co-operation with those who know the material at first hand and who also are sincerely working to exploit nothing but to develop the latent and inherent possibilities of a worthy material. Such architects exist, such material men exist. They should come together. It should be a function of such conferences as this to bring them together.

I must say one word here as to what should characterize the architect in whom the material man and the public may well place their confidence, being assured that his will be leadership—real leadership and not selfish and autocratic domination. That architect must not exploit any material or system, but must be able to recognize and free to employ the most effective and appropriate under the individual conditions. He must sense the sociological, including the social, ethical and aesthetic tendencies of his time so as to aid his client in the sympathetic expression of them, curbing wasteful, demoralizing, disintegrating tendencies, and aiding toward social unification; diagnosing present conditions and meeting the situation with skill and clarity of vision rather than in applying formulae learned by routine in the schools. The architect should think in advance of the public and see the goal and the way thereto more clearly. Pity the public which follows, and condemn the architect who pursues the selfish and blind course.

Now, in so far as this paper constitutes a report to be discussed or otherwise sent to oblivion or laid aside for future reference, which amount to about the same thing, its elements may be summarized and augmented as follows:

IMITATIONS.

Concrete has a character of its own; there is no call to torture it into imitations of stone, wood, bronze or other material. Details cast in molds should bear the plastic touch of the modeler and not the chisel marks of the sculptor.

ECONOMY.

Forms suited to the special purpose should be used—and forms extravagant of labor and material should be avoided and should be employed only where duplication can be accomplished without monotony.

MONOTONY.

Even a good thing ceases to be a good thing when used in excess, and two concrete houses from the same forms, placed side by side, as an excess—such treatment is permissible only in barracks where men are in uniform and drilled into the same line of thought, act and movement, all individuality being eliminated.

SLABS.

Flat slab roofs may at times and in places be appropriate. A general use would be deadly unless counteracted by features the initial expense of which would more than offset the element of economy, which alone would seem to call for a wide prevalence of such roofs.

MONOLITHIC FORMS.

This method presents advantages in certain types of structure. The appearance of mass and strength is enhanced by monolithic treatment. Openings and corners can be characteristically and ornamentally treated at slight or no additional expense. Houses pre-cast from monolithic forms and transported as slabs or as units are to be looked upon with suspicion as tending to create types and general monotony.

BLOCKS.

(a) *Units.* Concrete blocks laid to be effective as units may perform a legitimate aesthetic as well as structural service. Texture and color can be given them. Their danger lies in exaggerated scale and general uniformity. Stone has the advantage of lending itself to cutting and fitting in length and height without conse-

(*Continued on page* 168.)

CONSTRUCTION

A · JOURNAL · FOR · THE ARCHITECTURAL
ENGINEERING · AND · CONTRACTING
INTERESTS · OF · CANADA

Αρχιτεκτονία

H. GAGNIER, LIMITED, PUBLISHERS
Corner Richmond and Sheppard Streets.
TORONTO - - - - CANADA
M. B. TOUTLOFF, Editor

BRANCH OFFICES:
MONTREAL—171 St. James Street.
E. R. Milling, Representative.
WINNIPEG—336 Qu'Appelle Street.
F. C. Pickwell, Representative.
NEW YORK—505 Fifth Avenue.
H. M. Bradley, Representative.

CORRESPONDENCE.—All correspondence should be addressed to "CONSTRUCTION," Corner Richmond and Sheppard Streets, Toronto, Canada.

SUBSCRIPTIONS.—Canada and Great Britain, $3.00 per annum. United States, the Continent and all Postal Union countries, $4.00 per annum, in advance. Single copies, 50c.

ADVERTISEMENTS.—Changes of, or new advertisements must reach the Head Office not later than the twentieth of the month preceding publication to ensure insertion. Mailing date is on the tenth of each month. Advertising rates on application.

CONTRIBUTIONS.—The Editor will be glad to consider contributions dealing with matters of general interest to the readers of this Journal. When payment is desired, this fact should be stated. We are always glad to receive the loan of photographs and plans of interesting Canadian work. The originals will be carefully preserved and returned.

Entered as Second Class Matter in the Post Office at Toronto, Canada.

WESTON WRIGLEY, Business Manager
FRED. T. HOLLIDAY, Advertising Representative

Vol. XIII Toronto, May, 1920 No. 5

The Claims of the Canadian Architect

In a much more general way than heretofore, sentiment is centering around the principle of utilizing Canadian products and ability in preference to going outside of the country for the commodities and services which enter into our daily life. Up to the present time this has perhaps been more noticeable as regards manufactured lines, and there are still some enthusiastic supporters of this principle in reference to their own business, who fail to recognize the necessity of extending its benefits to other branches of Canadian endeavor. Under the above heading INDUSTRIAL CANADA deals editorially in a recent issue with that phase of the question which affects the architectural and contracting interests. In this connection our contemporary says:

"Every reasonable effort to make the Made-in-Canada campaign thoroughly consistent should be practiced by its sponsors and supporters. It should unquestionably be a well-rounded and comprehensive scheme to maintain and enlarge the business and industrial activities of the nation. Nor should it be limited to the buying and selling of commodities. It is quite as deserving of recognition in the case of the professional man, who is contributing his quota to the upbuilding of the country.

"The business and professional elements come into close contact in the case of the architect. Not only does the architect create, but he also has a great deal to do with prescribing methods and materials. To urge upon him the desirability of using Canadian-made materials in the erection of buildings is important, but it is equally important that the men or companies who are erecting buildings should give a preference to the Canadian architectural profession in arranging their plans. The brains of Canadians are as deserving of recognition as the products of Canadian factories, and when new construction is contemplated, the consistent course to pursue will be not only to requisition the use of Made-in-Canada materials but to insist on the employment of Canadian architects and contractors as well."

Our contemporary looks at the facts of the case logically. If the resources of Canada are to be fully developed, and the country put on an independent and self-sustained basis, it is necessary that all branches of industry and service should be part of a general policy. The manufacturers more than anyone else can best support their own interests by considering at the same time the interests of others within the country. To encourage preference for Made-in-Canada goods and to ignore Canadian ability and service in the designing and erection of the buildings in which these goods are manufactured, denotes at its highest estimate a self-centered and narrow vision which fails utterly to see things in their bigger aspect.

◆

Regina Architects Form Local Chapter

The Regina members of the Saskatchewan Association of Architects have formed a local chapter with a view to promoting a more frequent interchange of ideas and of giving mutual support and protection to local interests of the profession. Those present at a recent meeting held for the purpose included Messrs. J. H. Puntin, E. Delay, W. G. Van Egmond, H. Dawson, F. Reilly, T. Carmichael, J. Turner, F. Portnall and A. J. Rowley (hon.-sec.).

The meeting was presided over by J. H. Puntin and subjects of interest to the profession were discussed, among them being that of drawing the attention of the public to the advantages accruing, especially in these days of high costs, from the employment of an architect qualified in accordance with the requirements of the Saskatchewan Architects' Act.

Super Cement

A new product known as "Super Cement" which, in view of the claim made for its waterproofing and other special qualities, should be of interest to architects and the building industry, is now being placed on the Canadian market. When appropriately mixed and gauged the resulting concrete, it is claimed, is so dense that it is impervious to water and will even resist the percolation of so insidious a liquid as aviation petrol, as has been demonstrated by its successful use for making storage tanks at numerous aerodromes throughout the United Kingdom. It is stated that the reason that concrete made with it is more effective in all ways than that made from ordinary Portland cement, is due to the fact that it is able to combine with sufficient water when gauged, to perfect its crystallization, provided the surface is kept moist while the whole of the setting continues. It differs essentially from other methods of making concrete waterproof because it does not depend upon mixing anything with the cement for the purpose of filling up its pores or coating the resulting concrete with any foreign substance with a like end in view.

Super cement, which is an English product, is now being made in Canada at Mount Dennis, Ont., and is distributed to the trade by the Alfred Rogers, Limited, Toronto. Some very informative literature setting forth the many purposes for which it can be used and dealing with its tensile and crushing strength, as well as tables of tests, are available to anyone interested upon request.

Personal Items

Thos. W. Lamb, Architect, New York City, has established a permanent office at 269 Victoria Street, Toronto, and would be glad to receive catalogues and samples from various manufacturers.

According to word recently received Mr. Oscar B. Raven, formerly of Toronto, is now in Hong Kong, China, where he is engaged designing a university which is being established at Amoy by a wealthy native philanthropist who is devoting his time and fortune with a view to providing better facilities for educating the Chinese. The promoter is a large owner of rubber plantations in the Malay Peninsula and has already built kindergarten, primary and secondary schools in his native village near Amoy. The scheme further contemplates separate schools for boys and girls in the higher grades, together with a normal school and other buildings which will provide complete educational advantages. Mr. Raven, who is an Englishman, spent a number of years working in various architectural offices in Toronto, and was with the Dominion Realty Company prior to leaving for China last year.

E. Telfer Arnoldi, registered architect, Toronto, formerly with Messrs. Langley & Howland, has taken offices for practice at 527 Confederation Life Building, and is desirous of receiving catalogues and samples from supply firms.

Mr. G. H. MacDonald until recently associated with F. G. Marani, Toronto, and who has been in Eastern Canada during the greater portion of the war, has returned to practice at Edmonton, Alberta, where his firm, Magoon & MacDonald, Tegler Building, have just won the competition for the new Y.W.C.A. building to be erected this year.

Representative of Tower and Clock Firm to Visit Canada

The representative of an English firm making tower clocks and bells will visit Canada shortly and desires to get in touch with buyers likely to be interested who should address the British Government Trade Commissioner, 260 Confederation Life Building, Toronto.

CONTRACTORS and SUB-CONTRACTORS

As Supplied by the Architects of Buildings Featured in This Issue.

HART HOUSE—UNIVERSITY OF TORONTO.

Billiard Tables, Brunswick-Balke-Collender Co.
Brick, Don Valley Brick Works.
Casements, Henry Hope & Sons.
Electrical Fixtures, F. C. Henderson.
Electrical Conduits, Conduits Ltd.
Electrical Equipment, Canadian Kranz Mfg. Co. & Sangamo Electric.
Electrical Contractors, Bennett & Wright.
Elevators, Otis Fensom Co.
Expanded Metal, Metal Shingle & Siding Co.
Fire Doors, A. Matthews Ltd.
Fire Escapes, McGregor & McIntyre.
Fire Extinguishers, F. C. Montgomery Co.
Furniture, T. Eaton Co.
Flooring (Linotyle), T. Eaton Co.
Flooring (Wood), J. C. Scott Co.
Flooring (Asphalt), H. H. Symmes & Co.
Glass (Stained), McCausland & Co.
Gymnasium Equipment, Harold G. Wilson.
Hardware Equipment, Aikenhead Hardware Co.
Heat Regulating System, Bennett & Wright.
Kitchen Equipment, Consumers Gas Co.
Kitchen Equipment, Gurney Foundry Co.
Marble, Hoidge Marble Co.
Marble, Italian Marble & Mosaic Co.
Ornamental Iron, McGregor & McIntyre.
Ornamental Iron, Canadian Ornamental Iron Co.
Painting (Great Hall), A. Scott Carter.
Painting (Interior), Faircloth & Winfield.
Painting (Waterproof), H. H. Symmes & Co.
Plumbing Fixtures, J. L. Mott Co.
Plumbing (Contractors), Bennett & Wright.
Pipe Coverings, Canadian Johns-Manville Co.
Plater, Hoidge & Sons (Balmer & Blakely).
Refrigeration Equipment, Linde Canadian Co.
Refrigerators, J. Hillock Co.
Radiators, Gurney Foundry Co.
Roofing, H. Williams & Co.
Steel Sash and Lead Work, Henry Hope & Sons.
Sprinkler Equipment, Bennett & Wright.
Structural Iron, McGregor & McIntyre.
Stone, Indiana Quarries Co.
Stone Contractors, Page & Co.
Serving Room Fixtures, J. Hillock Co.
Theatre Seating, Globe Furniture Co.
Tables (Great Hall), Stanley Sowden.
Upholstery and Drapery, Stanley Sowden.
Vacuum Cleaners, Spencer Vacuum Co.
Ventilating Fans, Sheldons Ltd.
Woodwork and Interior Trim, J. C. Scott.

Barrett Specification Roofs
Bonded for 20 and 10 Years
Capital Stock $2,000,000.00
UNITED STATES FIDELITY & GUARANTY COMPANY
BALTIMORE MD.
Barrett Specification Roof
20 Year Guaranty Bond
Know all men by these presents
The Barrett Company
ATTEST
ATTEST

Massey-Harris Bldg. No. 8, Toronto, Ontario. Roofer, McDermid Bros., Toronto. Gen'l Contractors: Sherwood & Sherwood, Toronto.

Lowest cost per year of service—

The building shown above is the latest addition to the big Toronto plant of the Massey-Harris Company.

Plans and specifications were prepared by the Company's own technical staff, and the construction throughout represents the most approved and up-to-date practice.

A Barrett Specification Roof was selected for the building because moderate cost and *guaranteed* long service make this the most economical roof it is possible to construct.

Free Surety Bond

The Barrett (20- or 10-year) Guarantee is not merely the warranty of a manufacturer or contractor. It is a Surety Bond, issued by a well-known Fidelity and Guaranty Company, which absolutely protects the owner from all expense for roof maintenance during the life of the bond.

The Guaranty Bond costs the owner nothing. It may be obtained on any Barrett Specification Roof of 50 squares or larger, in towns of 25,000 or more, and in *smaller places where our Inspection Service is available.* The only conditions are that the roofing contractor shall be approved by us and The Barrett Specification, *revised April 15, 1920,* shall be strictly followed.

Important Notice

The Barrett Specification 20-Year Bonded Roof is the most permanent of all flat roofs. And while we bond it for twenty years only, it usually lasts well over thirty years.

For those who desire a somewhat lighter and lower priced roof-covering, we recommend the Barrett Specification Type "A" Roof, bonded for 10 years.

Full details regarding these Bonded Roofs and copies of the Barrett Specification sent free on request.

The Barrett Company
LIMITED

MONTREAL TORONTO WINNIPEG VANCOUVER
ST. JOHN, N.B. HALIFAX, N.S. SYDNEY N.S.

Concrete : Its Uses and Abuses

(*Continued from page* 164.)

cost and permanence or durability, let me say quent economic waste. The manufacture of concrete blocks should be studied with variety of size as well as appropriate scale in mind. Corners and angles should be true, and crude and rock-faced surfaces avoided.

(b) *Backing for Stucco.* This is a legitimate field for the use of concrete blocks. Scale need not be taken into account; neither need such matters as sharpness of corners and angles or crudity of surface. Uneven chipping where blocks are cut approximately to the desired outline presents no obstacle to the perfect finish. Surfaces should be such as to which the stucco will most readily adhere.

COST AND PERMANENCE.

In a letter from an official of the United States Housing Corporation I find these words: "We were satisfied that there were certain types which would produce a good practical house at a very moderate cost, but it appeared to us that this could be done only where the same unit was repeated indefinitely, and our belief was that this would produce a deadly monotony." As to the monotony we have already heard; as to the that there may be cases where permanent houses would be a drawback in a developing community. There would be very little salvage in a wrecked concrete house, while the wrecking would entail almost as much expense as the constructing. Unless a community is well "zoned," buildings of a too permanent nature are an economic waste, even though the initial cost may be the same as for a building of less permanent character. Where, as in many of our communities, change is the order of the day, well constructed buildings of a more temporary nature are desirable. Buildings of a temporary nature can be "fire stopped" and made safe for occupancy.

FIREPROOF CHARACTER OF CONCRETE HOUSES.

In the letter above referred to, these words appear: "We found that the people who were interested in the concrete house were, almost without xception, trying to build every part of the house in concrete, including porches and all the trim." This would seem to me to indicate a deficient sense of humor on the part of the people referred to, as well as defective vision. I will grant that the designs of many architects who never intended to make a joke of their work are such as to be readily translated into concrete and would not lose in the process; but a concrete man with a sense of fitness, I'll call it humor, would not deign to affect the translation. I must still warn the enthusiast against excess; excess of imagination as well as excess in material means, or some of them may wish to make the door hinges out of concrete after all! Fireproofness, so to speak, and permanence are good qualities, for which it is possible at times to pay too much.

METHODS AND MEANS.

How to make the house reasonably fireproof, reasonably durable, reasonably attractive and reasonably aconomical in cost and in upkeep presents a series of problems for the architect and the concrete expert. As an architect, I shall receive the findings of the concrete expert and will make such application of the methods and means presented as may suit the particular case. I will even present the case beforehand to the expert—if it is not already covered—and aid him in his solution. I will even ask him now to present types of floors in structure and finish which are durable, economical and appropriate to a small house. I will ask the same concerning the roofs, high-pitched, low-pitched and flat.

There are many problems to be solved in connection with the design, construction and location of the concrete house, and I congratulate the concrete and cement interests that they have enlisted the services of so many serious-minded and enthusiastic men in the quest for the best along these lines. I hope that architects of vision and deep feeling may be called upon to co-operate.

Exhaustion of Southern Pine

According to a bulletin just issued by the Spruce Production Corporation of the United States War Department, only four mills out of 2,043 southern pine mills have timber supplies (southern pine) which will last more than twenty years. More than 1,600 mills will have exhausted their supplies in five years or less, and more than 1,900 mills in ten years or less. Attention is drawn to the fact that this rapidly approaching depletion, coupled with an expanding world market for timber, is bound to result in heavier demands upon the great timber areas of the Pacific coast and Canada. The present generation of timbermen in Canada will probably benefit as a result. This benefit may be extended to posterity if the short-sighted policy of the southern lumbermen is avoided.—CONSERVATION.

Enamelled Wire to be Manufactured in Canada

An addition is being built to the plant of the Eugene F. Phillips Electrical Works, Montreal, to provide a department for the manufacture of enamelled copper wire. This represents a new branch of industry in Canada.

It is also understood that the Canada Wire & Cable Company, Leaside, Ont., will shortly be turning out a similar product.

CONSTRUCTION

June, 1920 Volume XIII., No. 6

CONTENTS

HART HOUSE DESIGNER 171
An Appreciation by F. S. Baker, F.R.I.B.A.

HENRY SPROATT AND HIS WORK 171
An Appreciation by Lt.-Col. W. M. Moorehouse, D.S.O.

RECENT EXAMPLE OF DOMESTIC WORK 173

CONDITIONS IN WESTERN CITIES SHOW IMPROVEMENT 184

WINNING DESIGN, Y.W.C.A. BUILDING, EDMONTON 191

TRIMSTONE AND BUILDING ORNAMENT 195
By Adolph Schilling.

EDITORIAL 199
Battlefield Memorials.

Full Page Illustrations

HENRY SPROATT, LL.D., R.C.A. 170

H. GAGNIER, Limited, Publishers
GRAPHIC ARTS BLDG., TORONTO, CANADA
BRANCH OFFICES
MONTREAL NEW YORK

HENRY SPROATT, R.C.A.

DESIGNER OF HART HOUSE,

Who has been given the Honorary Degree of Doctor of Laws by the University of Toronto.

Hart House Designer

An appreciation by F. S. Baker, F.R.I.B.A.

Those who have resided in Toronto, or vicinity, during the last thirty years will join the writer—if they are interested in the development of art in Canada—in a brief tribute to the works of that famous and distinguished, and still young, architect and artist, Henry Sproatt, LL.D., whose photograph appears with this attempt of an old friend and colleague to express his admiration and appreciation of his great achievements in architecture.

The son of a great Canadian engineer, whom this country will never forget, he naturally turned to architecture upon leaving Varsity. Hard, steady work as a student at his drawing board in the offices of his early masters brought him to the broad road to success, along which his career has ever been onward and upward, until with his equally eminent partner, Ernest R. Rolph, he is ready to retire with great content. This is merely the writer's idea, no doubt Dr. Sproatt and his accomplished partner have other views and will be prevailed upon by many future clients to add to his achievements. The works which he has already accomplished speak for themselves. One by one they have been published, drawings and films, until that most recent and perhaps most important and most beautiful of all—Hart House—has just appeared in great detail in CONSTRUCTION.

The writer, if he may be permitted the space, feels that he should not leave this subject without reference to the great usefulness of good architecture in the development of a young country like Canada, where materialism necessarily prevails and will for some time, no doubt. The beautiful works of Dr. Sproatt, especially, perhaps, those Collegiate Gothic structures now famous for their beauty, will direct much thought and action on the part of those contemplating building in higher planes of art.

Henry Sproatt and His Work

An appreciation by Lt.-Col. W. M. Moorehouse, D.S.O.

The clever type of architectural design may often exercise on the community an influence which is not of the best. It may create a fashion to be seized upon by a host of imitators whose work will be but the mask of the original without its animating fire. The world is full of just such architectural corpses. This condemnation, however, cannot be applied to the architecture of Henry Sproatt, R.C.A., on whom the University of Toronto has just conferred the honorary LL.D. degree. With a thorough knowledge of what has been done in the past, he is not tied to tradition, for tradition's sake. With a complete equipment of architectural technique, he is never carried away by false ideas of originality in an art which, with its many limitations, must be evolutionary.

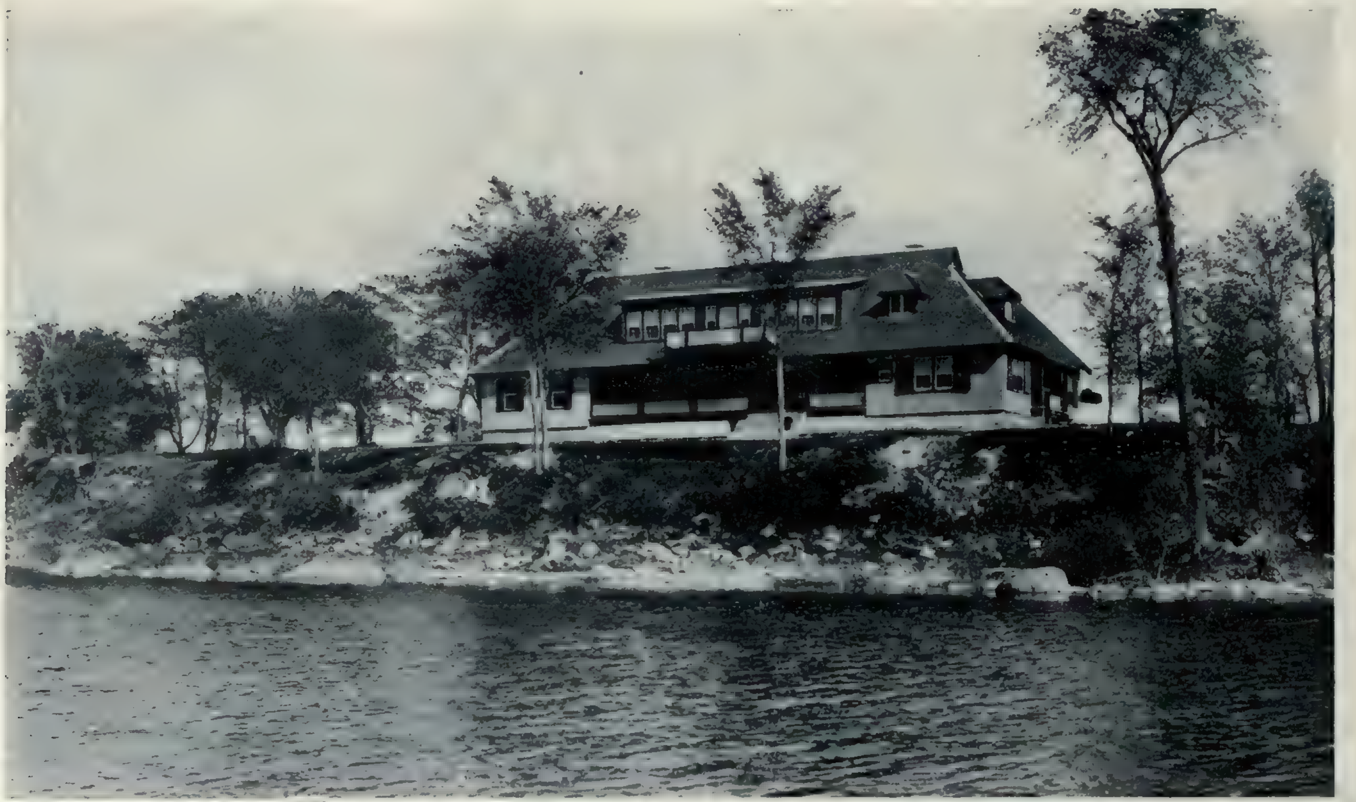
Possessing a keen sense of construction, he has always adapted his knowledge to existing conditions. His is the evolutionary type of design and not the passing whim of fashion that the future mind will condemn. That is why the work of Henry Sproatt is good and will live. It is difficult to state in words just what constitutes the charm of his work. It leaps into the mind of the trained observer, and grows in the mind of the untrained. The secret must lie in the simplicity and genuineness of his methods in dealing with a problem. His structures are not built piecemeal with certain features studied and elaborated as the work proceeds in such a manner as to detract from the harmony of the whole. His plan develops on simple, logical lines, and with its development the proportions and mass are visualized. His idea in the abstract is never dominated by detail as the building assumes concrete form. Almost always one sees the finished building in his preliminary sketches, and these are not like the flattering portrait that leads to disappointment in the original.

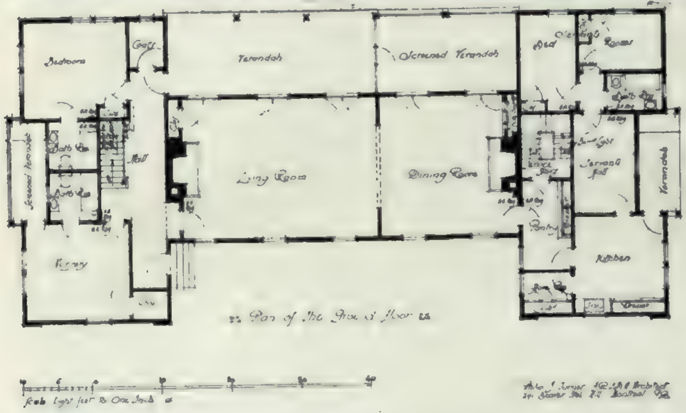
Until 1904 his work was mainly in the classic styles of architecture, in which he shows the same refinement and restraint that characterize his present design. It was the Metropolitan parsonage that definitely determined the Gothic trend of his work. In this style he has shown himself big enough to look for the weak points in what he has done, and the result has been a steady development—Victoria College Library, Burwash Hall, Hart House—each telling its story of patient study and growing facility. Many outside interests are involved in the study of architecture, and in these Henry Sproatt has developed unusual versatility. He is the true collector in whose estimation of a piece, its market value plays little part. His home and office are full of objects of high artistic merit, paintings, china, silver, each piece with its individual charm and interest.

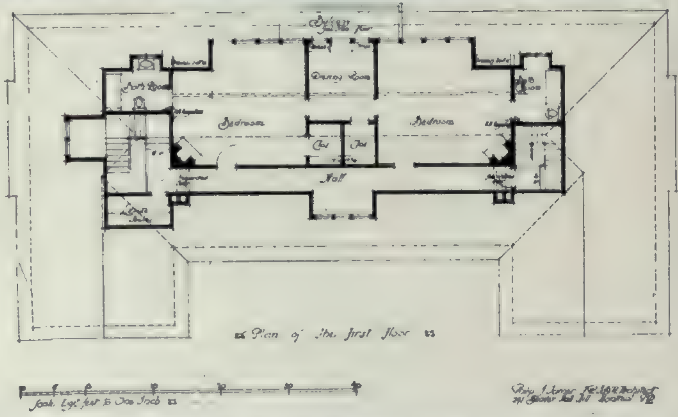
This article is not in any sense biographical and is not therefore the place for remarks of a personal or anecdotal nature. Any such remarks would presuppose the idea that the subject were not present to defend himself.

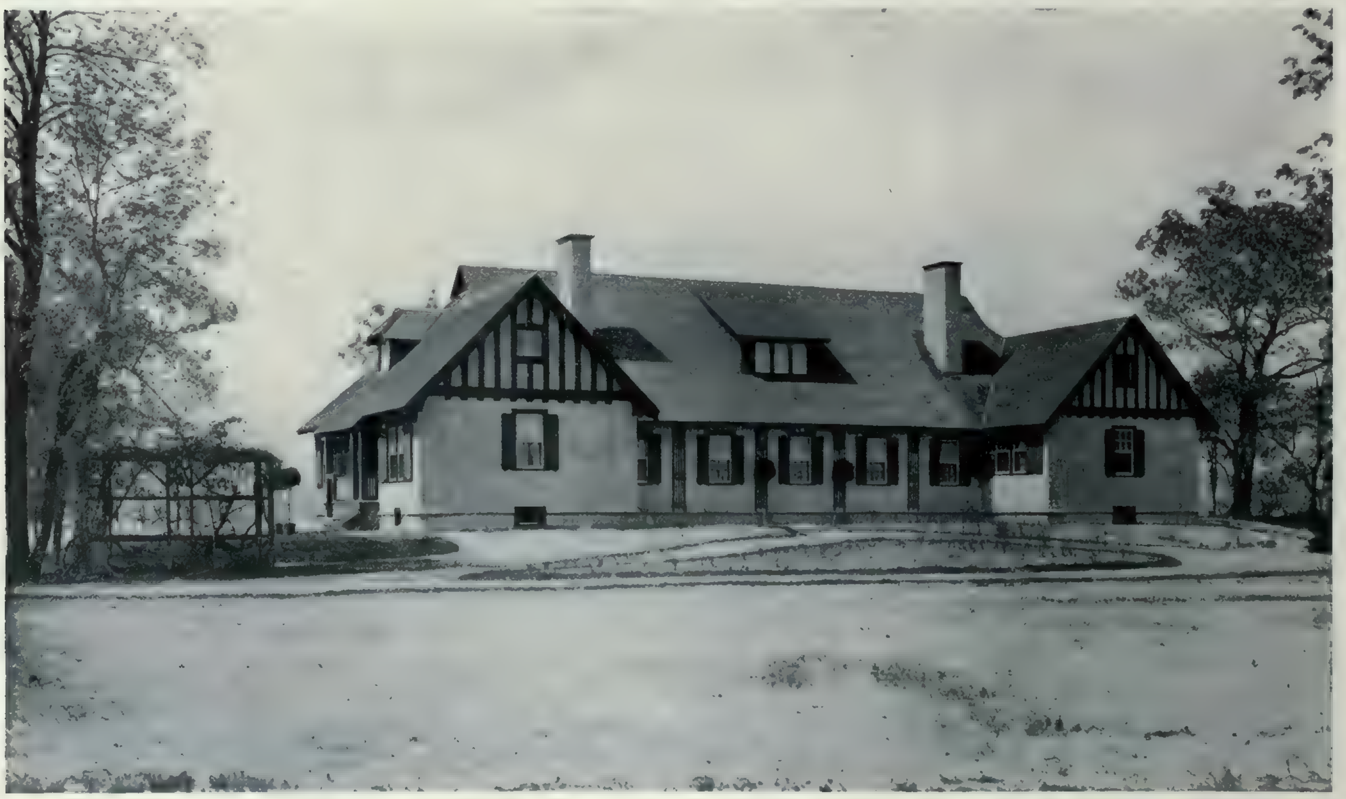
In pointing to the past work of Henry Sproatt the writer wishes to indicate the promise of the future. Such a man's work is his life, and whether recognition comes or not, the reward is always his—

> Who toils to leave as his bequest
> An added beauty to the earth.







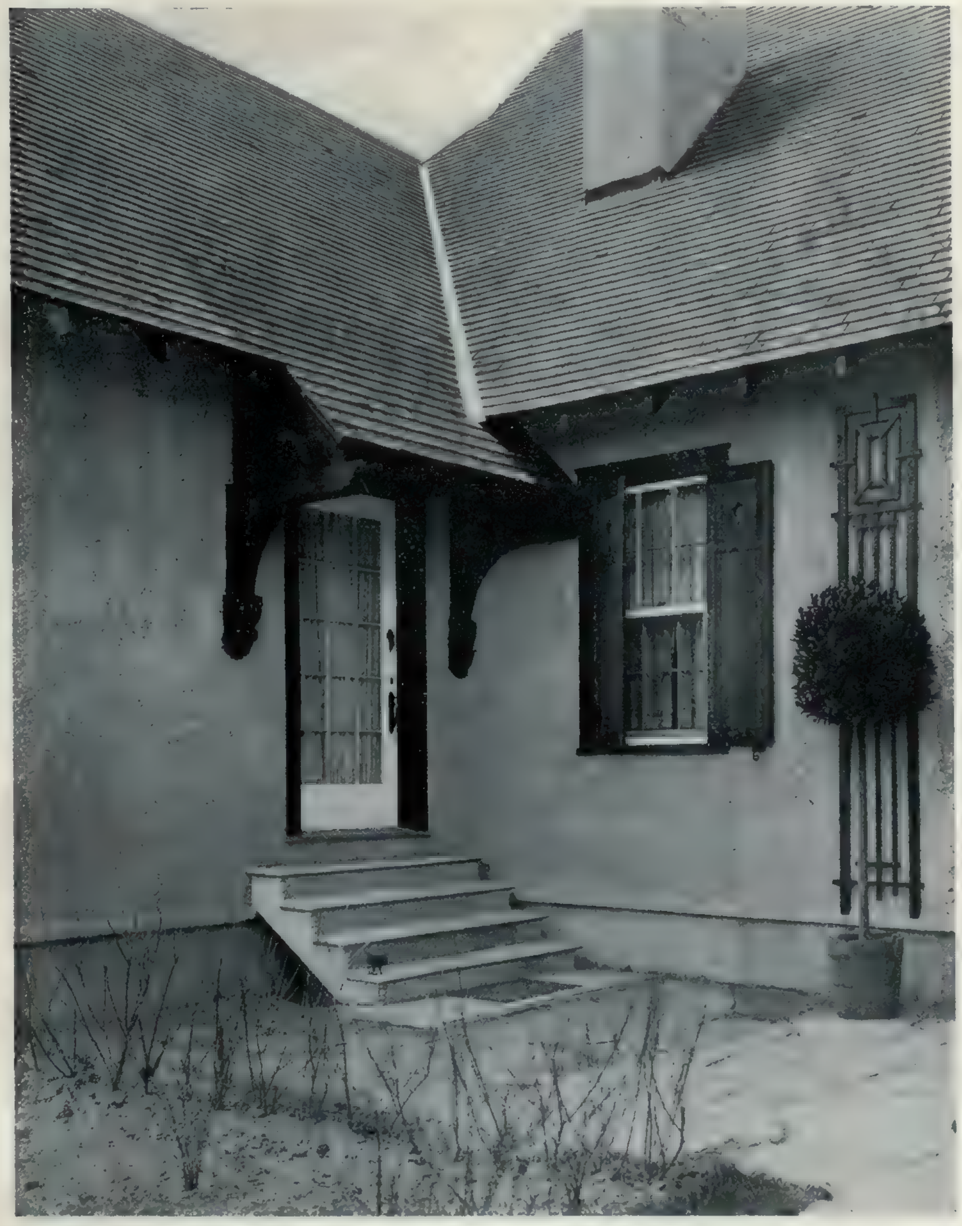


SUMMER RESIDENCE OF N. SCARTH STEVENSON, POINT CAVAGNOL, COMO, P.Q.
PHILLIP J. TURNER, ARCHITECT.

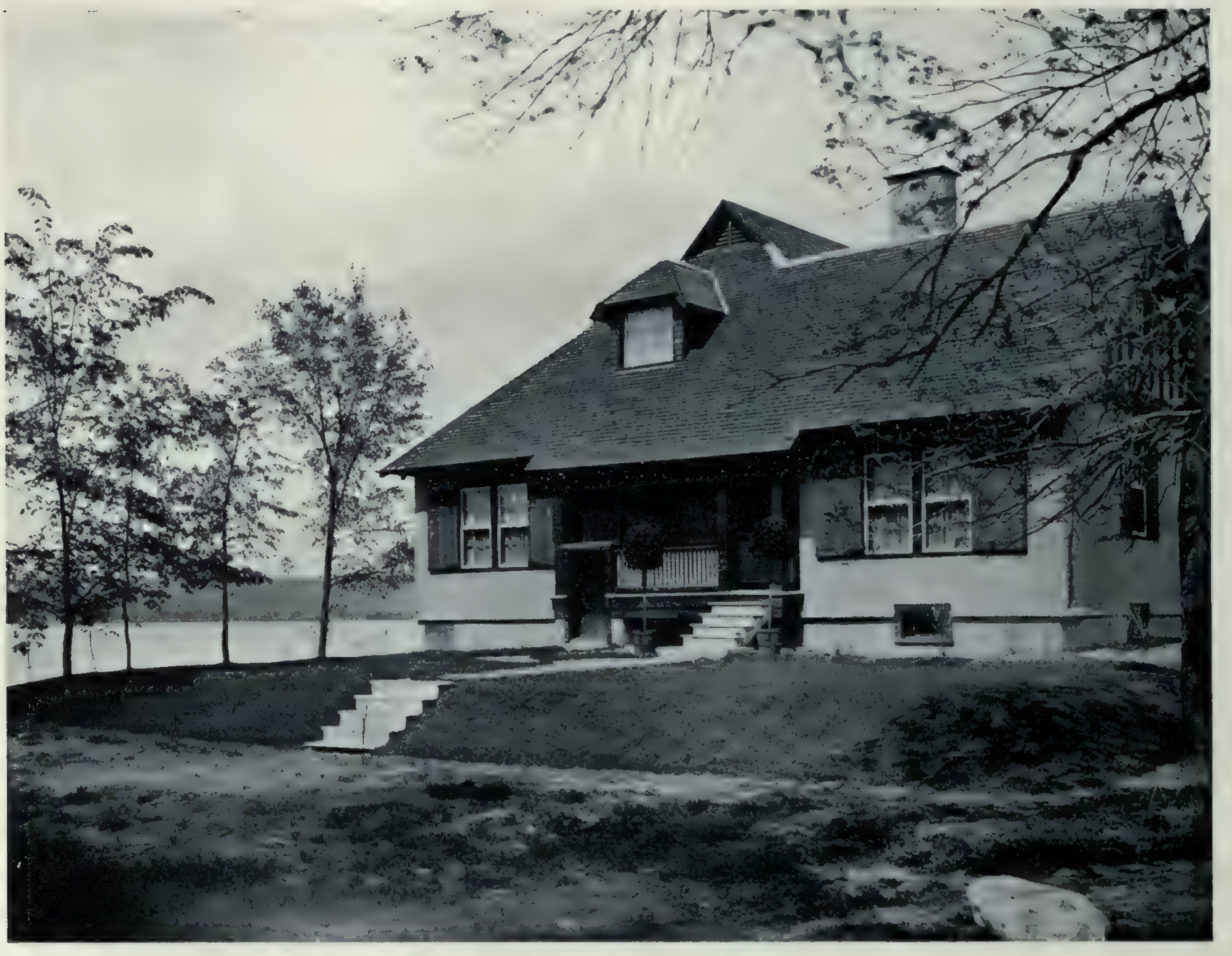
Recent Examples of Domestic Work

IT would seem that as regards our domestic architecture we are in the midst of "the best of times and the worst of times." The best of times in that the principles of town planning and housing which affects the growth of our towns and cities in their bigger aspect, are more generally understood, and the worst of times perhaps because instead of these principles being more broadly recognized and put into practice, there is a tendency in certain municipalities to lift existing restrictions to an extent owing to inadequate accommodations and the present cost of materials.

However, notwithstanding this condition which constitutes an encouraging hope on one hand and unfortunate possibilities on the other, there is at least as far as the better residential work is concerned, much evidence of substantial progress. The trend, if anything, is toward truer forms and a more honest and saner use of materials. We perhaps best note this progress by comparing present developments with the character of work done in the past when the carpenter-designers perpetrated his jig-saw fancies, and to the less remote time when even under better auspices, false timber work, box-beams and the like, sprang from the designer's bag of tricks. The latter was in many ways an illogical period to which the present stand out at least in the achievement of aesthetic results by more legitimate methods.

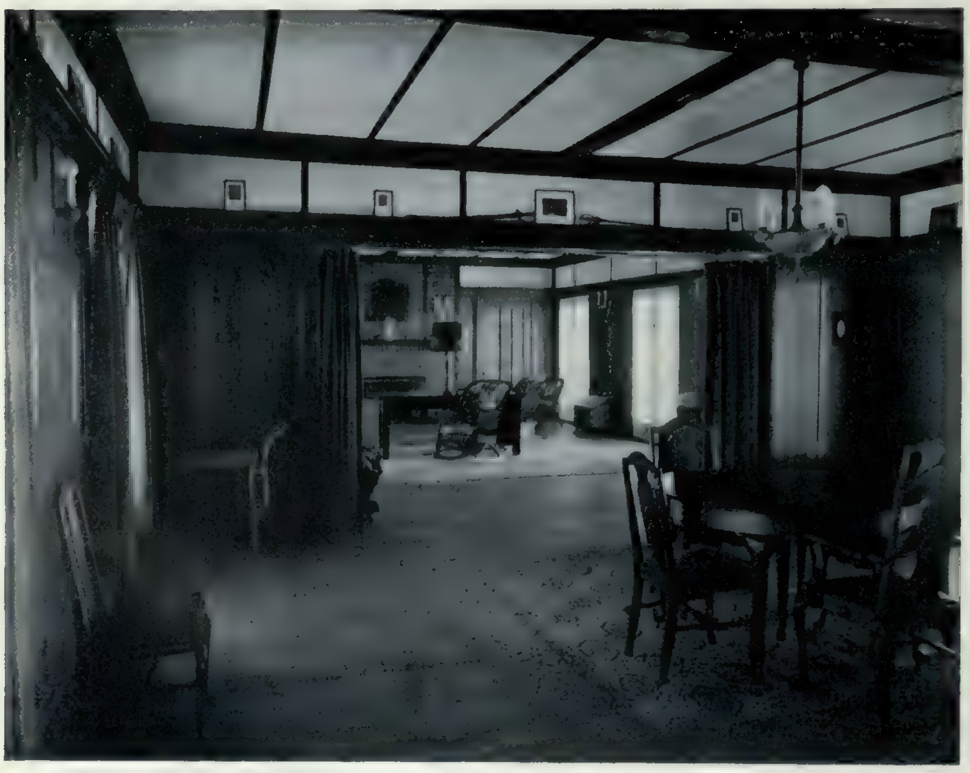

ENTRANCE, SUMMER RESIDENCE OF N. SCARTH STEVENSON, POINT CAVAGNOL, COMO, P.Q.

Not that this is to be construed as implying that all is well with our residential work. The reference to the progress made is intended to relate to the work which emanates from the architectural offices. A contrast, and admittedly a highly unsatisfactory one, stands out in the product of the speculative builders, whose houses duplicating one another in extended rows, are abundantly in evidence outside of the more restricted residential sections. With these operators the simple reversal of a plan suffices to establish the required variance or individuality which distinguishes one dwelling from another. Thus, if the bay projection is on the right and the verandah on the left in one structure, the opposite is in order with the house which adjoins, and thus in many cases whole residential blocks are built up. Moreover, it is the speculative builder more than anyone else who is responsible for the many exotic examples of domestic work in our midst. The California bungalow in itself is delightful in its western environment, but it is of doubtful quality when it is adopted without modification in



VIEW FROM LAKE: HOUSE OF N. SCARTH STEVENSON, POINT CAVAGNOL, COMO, P.Q.

more remote surroundings. Viewed from almost any angle, either architecturally or constructively, these speculative houses are sadly out of perspective with the more thoughtfully considered homes. Nothing could possibly more fully point to the necessity of some legalized form of qualification for the men who are entrusted with the designing and erection of our buildings than this class of work. Indeed at no previous time has the need existed as it does to-day for the careful consideration of all that pertains to our domestic development. Houses are urgently in demand, but even in view of this, especially as they are one of the most necessary and visible assets of a community, there is no reason why even in low cost work, good design and careful workmanship should be sacrificed to the exingency of the moment.



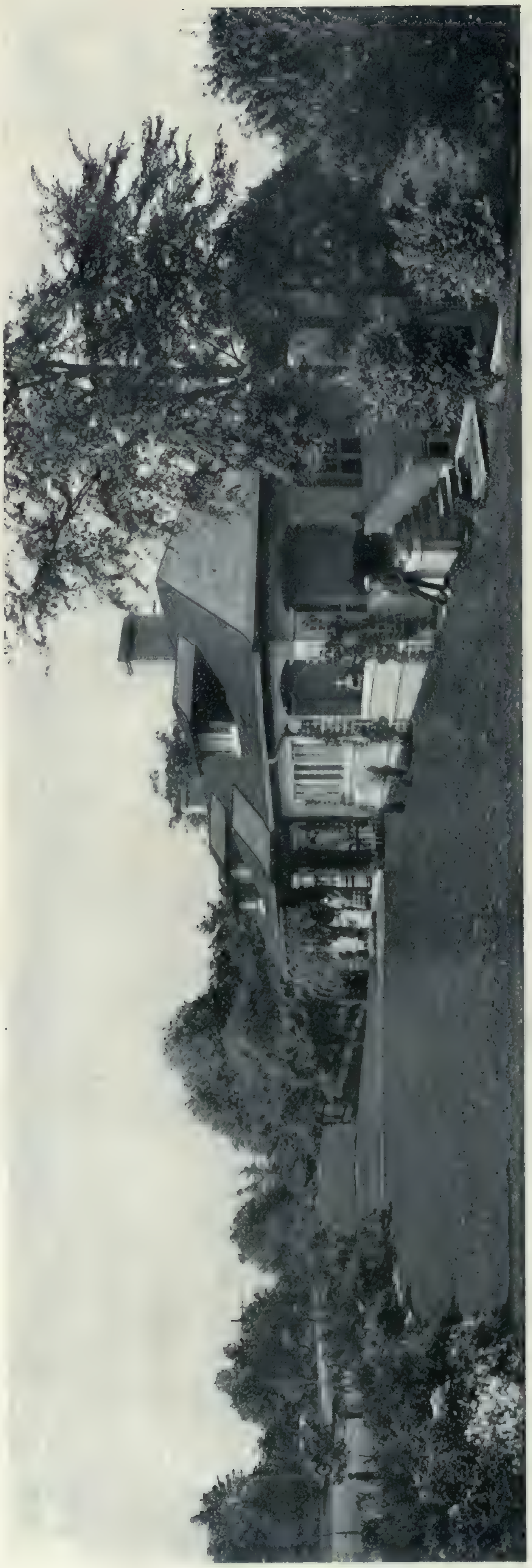
INTERIOR LOOKING TOWARDS LIVING ROOM.

Briefly, the greatest

DINING ROOM: HOUSE OF N. SCARTH STEVENSON, POINT CAVAGNOL, P.Q.

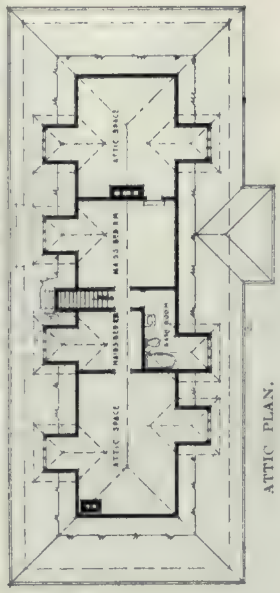
hope of the present lies in the work which the architects themselves are doing. Through their efforts the public is gradually being educated to appreciate the more acceptable forms of architectural expression, and people of average means are coming to demand something more conducive to their domestic and social betterment. One of the encouraging indications to be noted is in certain residential districts that land holding companies are developing along lines which proved eminently successful in England prior to the war. Several of these projects are now being carried out with most satisfactory results by progressive real estate owners, but wisely the promoters have placed the laying out of the grounds and the designing of the buildings entirely in the hands of competent designers and landscape architects. While as yet none of these projects have been

GALLERY AND SCREENED DINING ROOM ENCLOSURE

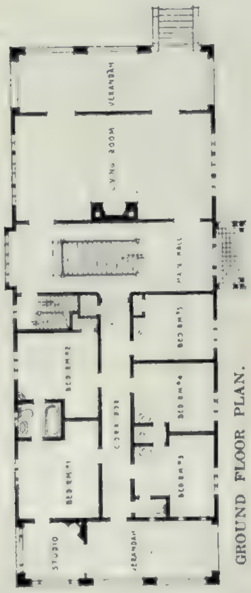


COUNTY RESIDENCE OF M. LANGMUIR, PORT CREDIT, ONT.

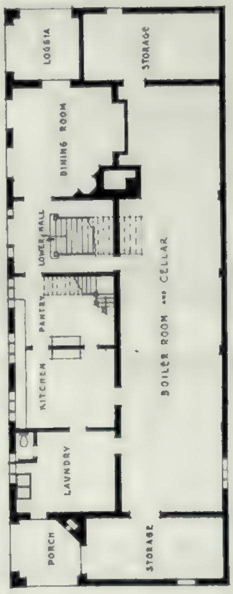
MOLESWORTH, WEST & SECORD, ARCHITECTS.



ATTIC PLAN.



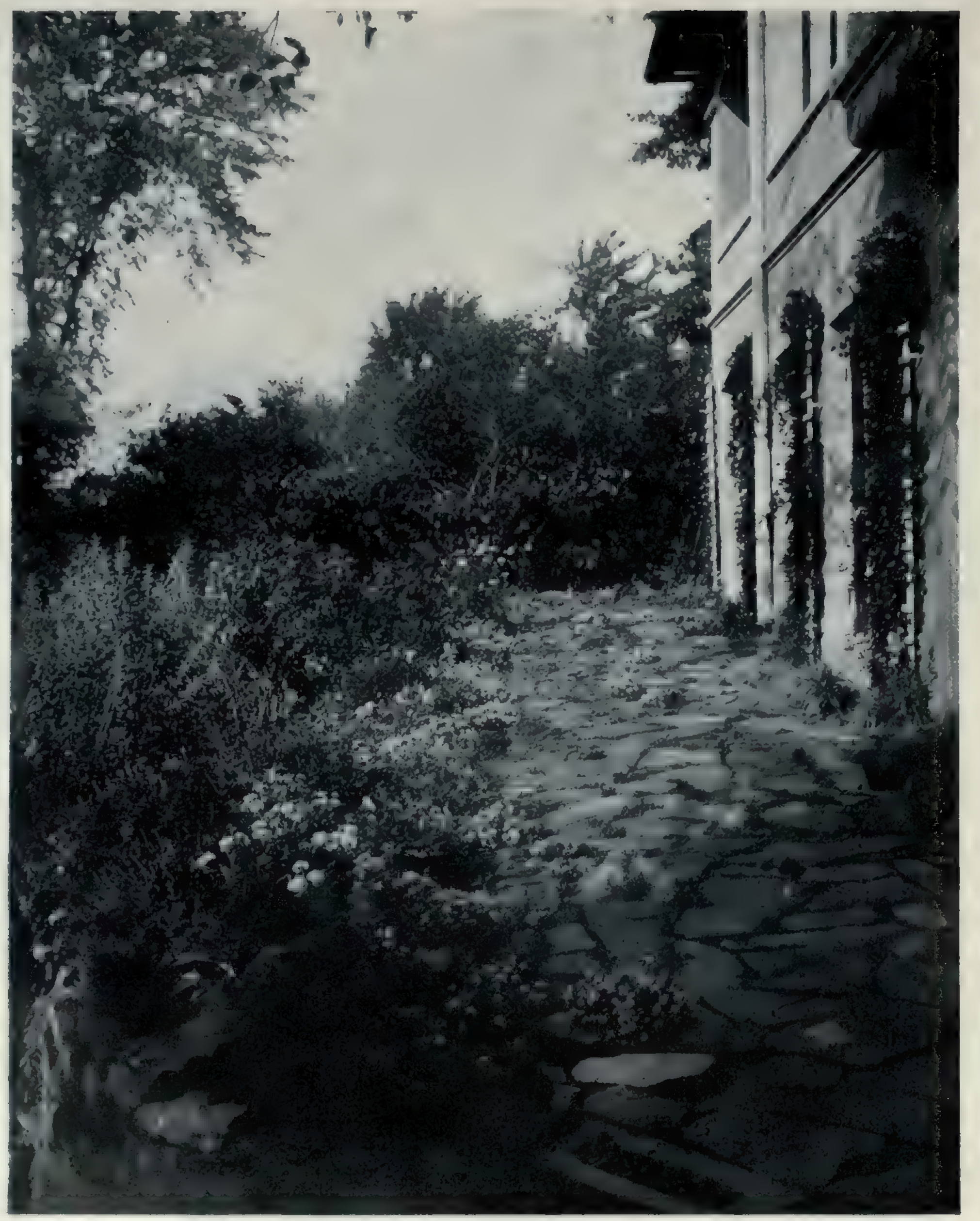
GROUND FLOOR PLAN.



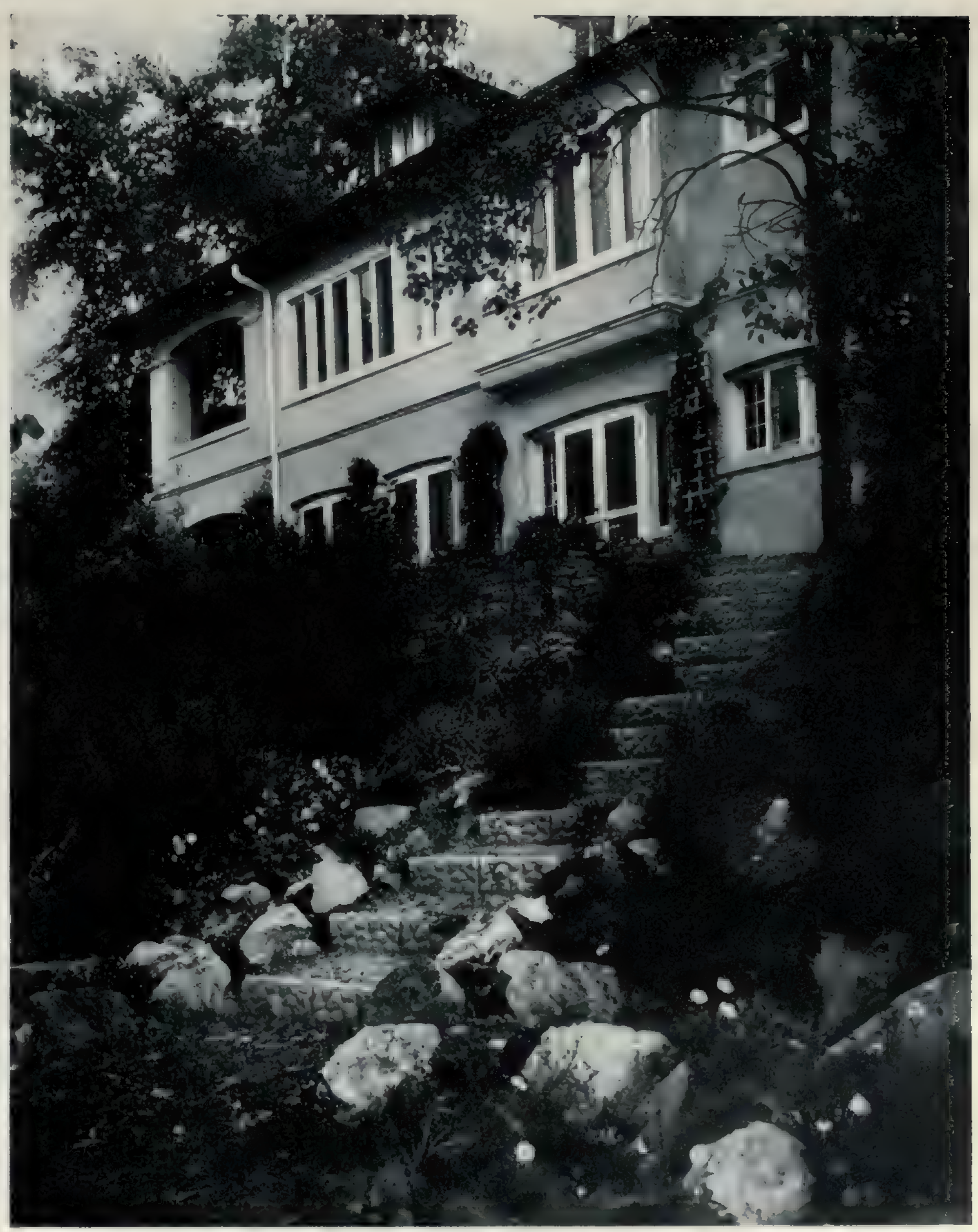
BASEMENT PLAN.

completed sufficiently to judge the final total results, enough has been accomplished to demonstrate the advantages of the scheme and to more than justify the restrictions which the promoters have imposed. The houses so far erected have been built with a proper regard to open spaces, vistas, trees and shrubbery. The natural advantages are preserved as much as possible, and where required necessary planting is done to add to the attractiveness of the setting. In practically every case the prospective owner has the option of selecting a designer other than the one the promoters employ, but in all respects the plan must conform to the regulations laid down, and meet with the approval of the architect in charge. This is done to avoid the danger of poorly planned and unsightly structures, so that the general scheme may be devoid of any incongruity, by bringing all buildings within proper architectural limitations.

Altogether, apart from the certain conditions earlier mentioned, there are many signs and material manifestations in the character of recent domestic buildings which are both assuring and promising. Various influences are at work to bring about a more perfect adjustment and to encourage still further progress in this respect. That one of these is the unprecedented commercial and industrial development of the country cannot be denied. Gradually the encroachment of modern business houses and manufacturing plants is bringing about the demolition of a large number of commonplace dwellings in the more central



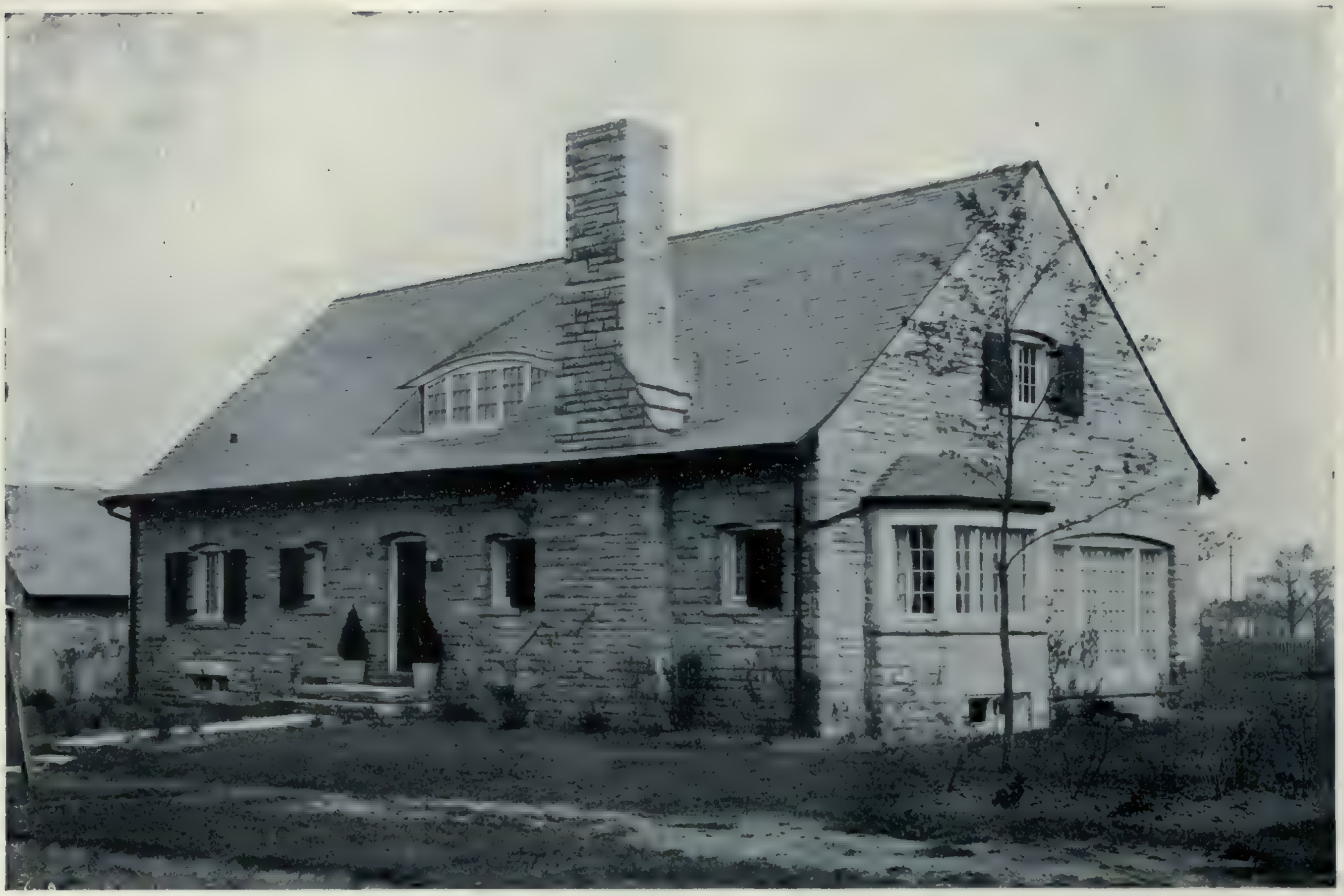
STONE PAVED TERRACE.



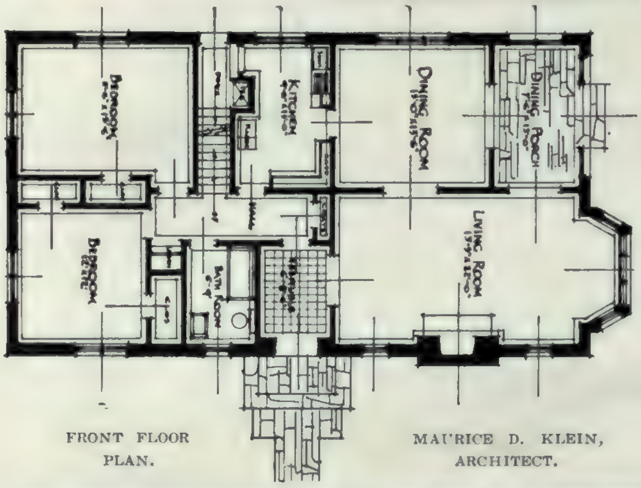
REAR ELEVATION.

COUNTRY RESIDENCE OF M. LANGMUIR, PORT CREDIT, ONT.

MOLESWORTH, WEST & SECORD, ARCHITECTS.



FRONT ELEVATION: RESIDENCE OF H. B. TABER, "CEDARVALE," TORONTO



FRONT FLOOR PLAN.

MAURICE D. KLEIN, ARCHITECT.

districts of our towns and cities. This in itself is giving a strong impetus to the upbuilding of the outlying residential parts and suburbs, besides bringing into our architectural growth the first initial evidences of industrial and private housing developments worthy of note.

The accompanying photographic views illustrate several moderate cost houses of diversified character, which are briefly described herewith, and indicate in a limited way the class of work which is being done.

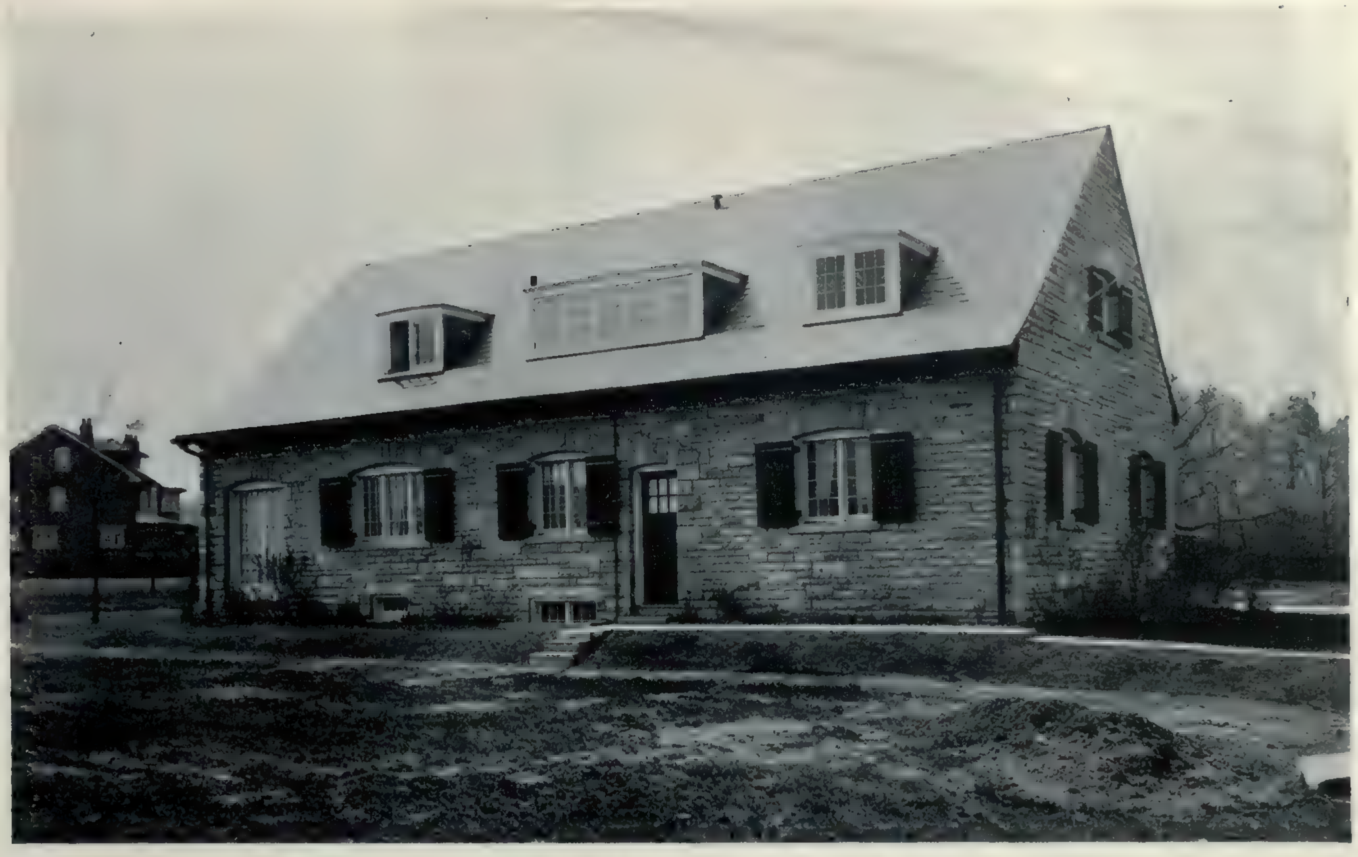
Summer Residence, Point Cavagnol, Como, P.Q.

Situated among beautiful and historic surroundings this house has been built on the south shore of the Lake of Two Mountains at Point Cavagnol, two miles from Como and about four miles from Vaudreuil.

From the large gallery, twenty-five feet above water level, a magnificent view of the lake and mountains is obtained, whilst opposite is the village of Oka, famous as the site of the well-known Trappist monastery.

The building is laid out with the living room and dining room occupying the whole of the centre of the block. They have a total length of fifty feet and width of twenty feet. On the south side is a gallery approached by five pairs of French casement doors. The portion at the east

LIVING ROOM.

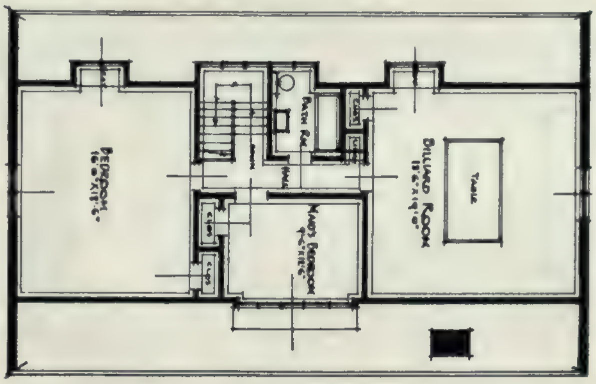


REAR ELEVATION: RESIDENCE OF H. B. TABER, "CEDERVALE," TORONTO.

end is screened so that it can be used as an outdoor Dining Room in fine weather.

These rooms are panelled to a height of seven feet in chestnut, and have large open fireplaces at each end carried up the whole height of the rooms and faced with hand-made Grueby tiles, in the centre of which are set old cast iron plaques representing the arms of France and Prometheus and the eagle.

The east wing of the house if given up to the kitchen quarters, pantry, two servants' bedrooms and bathroom; and in the basement a hot-air furnace, water system and pressure tank.



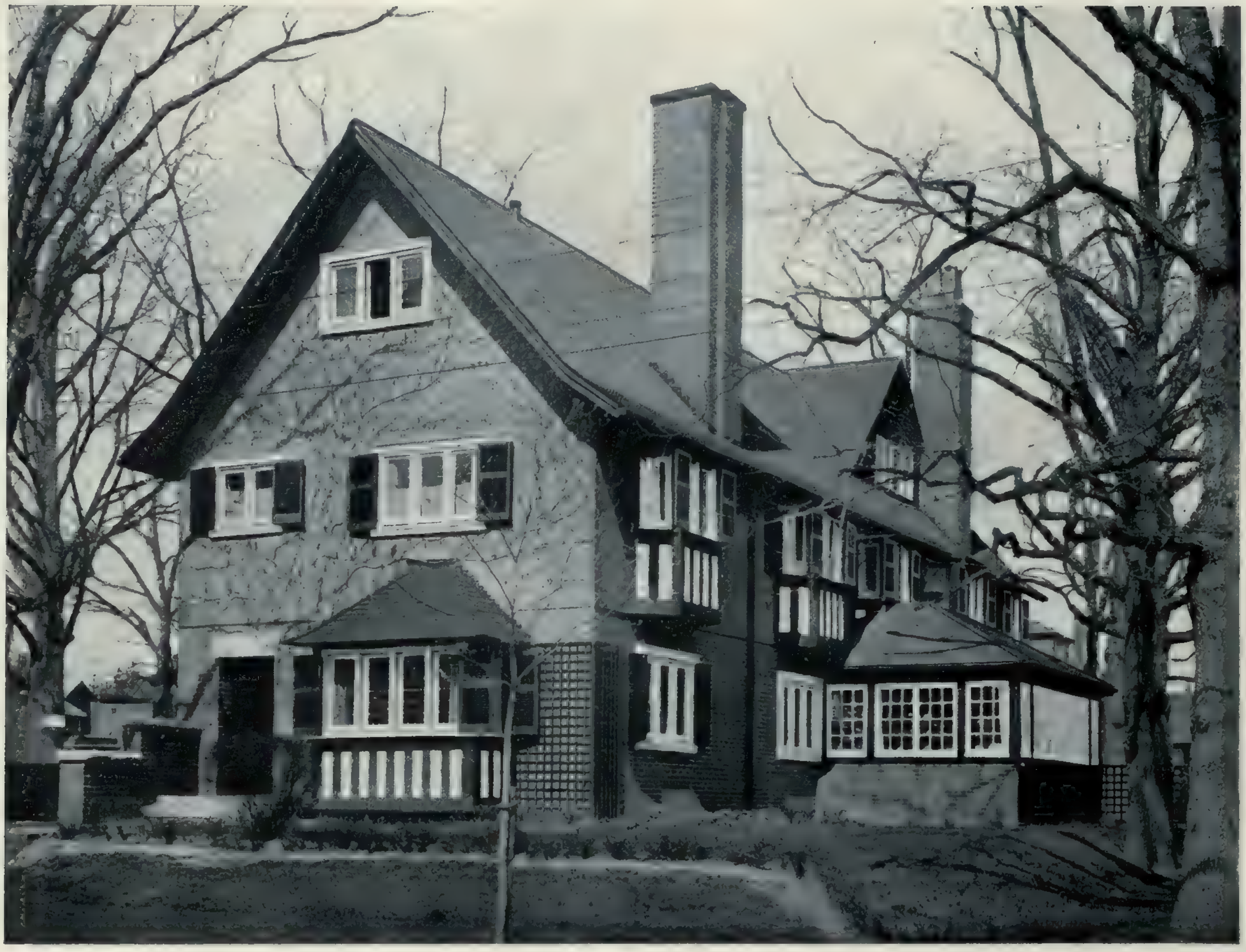
SECOND FLOOR PLAN.

At the west of the house is placed the main entrance with a nursery suite and separate small gallery, guest's bedroom, and extra furnace in cellar.

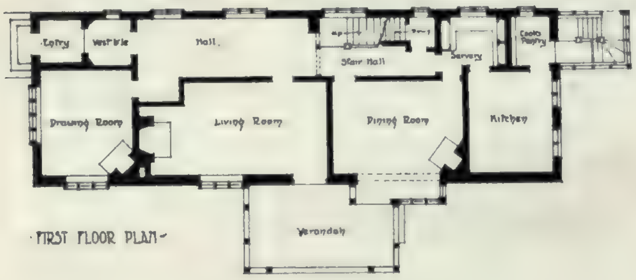
The upper floor is placed entirely in the roof space thus presenting the desired appearance of a one-storey bungalow. It contains the two best bedrooms of the house, each 19 ft. 6 in. x 17 ft. 6 in., with open fireplaces and wide windows commanding the view of the lake. Each of these rooms is provided with its own bathroom, and a dressing room occupies the centre from which access is obtained to a balcony. These rooms are also fitted with specially built-in wardrobes and cupboards.

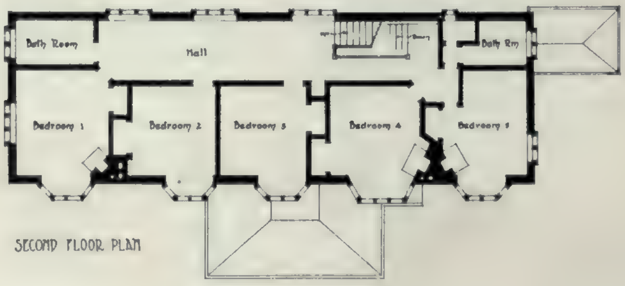
The interior of the house is lined with British Columbia fir with the exception of the dining room and liv-

GARAGE.



RESIDENCE OF MRS. T. G. BROUGH, TORONTO. EDEN SMITH & SONS, ARCHTECTS.





ing room which are panelled with chestnut, with wall board and panelled friezes and ceilings. The floors throughout are of birch.

The outside of the building is covered with a rough cast in cement finished a light primrose color, and the roof is covered with shingles treated with a chestnut stain.

Interest is given to the simplicity of the entrance front by the introduction of trellis work standards between the windows and shutters to the windows which have specially made wrought hinges and "S" catches of antique design.

LANGMUIR RESIDENCE, PORT CREDIT, ONT.

In the Langmuir residence at Port Credit, Ont., the firm of Molesworth, West & Secord have taken full advantage of the possibilities of the site and have produced a scheme which to say the least is striking. It is a charming small country place with beautiful lawns and planting, overlooking the links of the Mississquoi Golf Club and having a far reaching view of the valley through which the Credit River wends its way. From the roadway it has the appearance of a one-storey structure, the dining-room and kitchen being located at a lower level where steps lead down to a stone paved path in a terraced garden. The design is in every way to be commended and harmoniously lends itself to the character of the surroundings.

RESIDENCES OF SIDNEY SMITH AND THOMAS MIX.

Two other examples by the same architects show solutions of the moderate cost house problem. The Sidney Smith house on the north side of Douglas Drive in North Rosedale, Toronto, is a simple design in brick. The feature of the plan is the combination pantry, rear entrance and rear stair. This is very economical of space and has the advantage of a kitchen with only one door to break the wall surface and cooking space, in addition to preventing kitchen odors ascending.

The house of Thomas Mix on Dinnick Crescent, Toronto, is an example in an entirely different style. The stucco is on hollow tile and the foundations are of brick. An interesting feature of the plan is the kitchen fashioned after the apartment house kitchenette, and the breakfast room, trimmed in white and blue, which on occasion can be used as a pantry or when help is plentiful provides a sitting room for the maid.

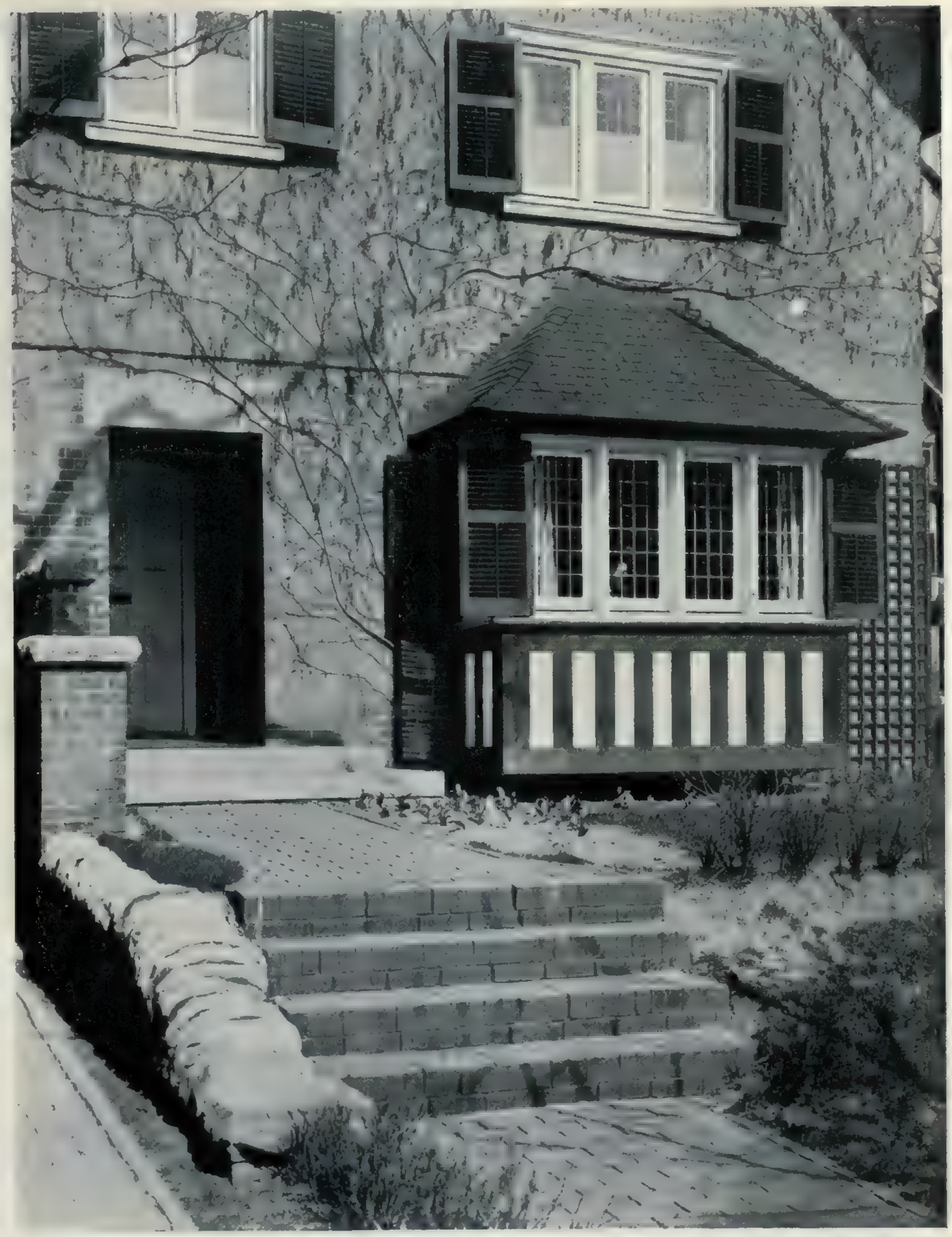
House of H. B. Taber, "Cedarvale," Toronto.

This house is located on a corner lot having 55 ft. on Raglan Avenue and 135 ft. on Hillbrow Avenue, in one of the newer residential developments where all plans must be submitted to a supervising architect for approval.

The plan consists of a large tiled vestibule, 6 ft. x 8 ft. 6 in., with French doors to the living room and a door to the rear hall which gives access to the staircase, bathroom, kitchen and two large bedrooms both having large closet space and cross ventilation. The dining room and the dining porch open off the living room through French doors. The dining porch is enclosed in glass and has a stone floor, and leads to a turf terrace. The French doors are treated like sash and painted white. The dining room panelling is in gumwood, 6 ft. high, and the living room has a 2 ft. 6 in. dado, treated above in stucco, and a stone fireplace of Tudor design.

On the second floor is a billiard room, 18 ft. 6 in. x 19 ft., a large bedroom 16 x 18 ft., bathroom and maid's bedroom. The entire woodwork is gumwood, walnut finish, and both bathrooms have tiled floors and Keen's cement dado.

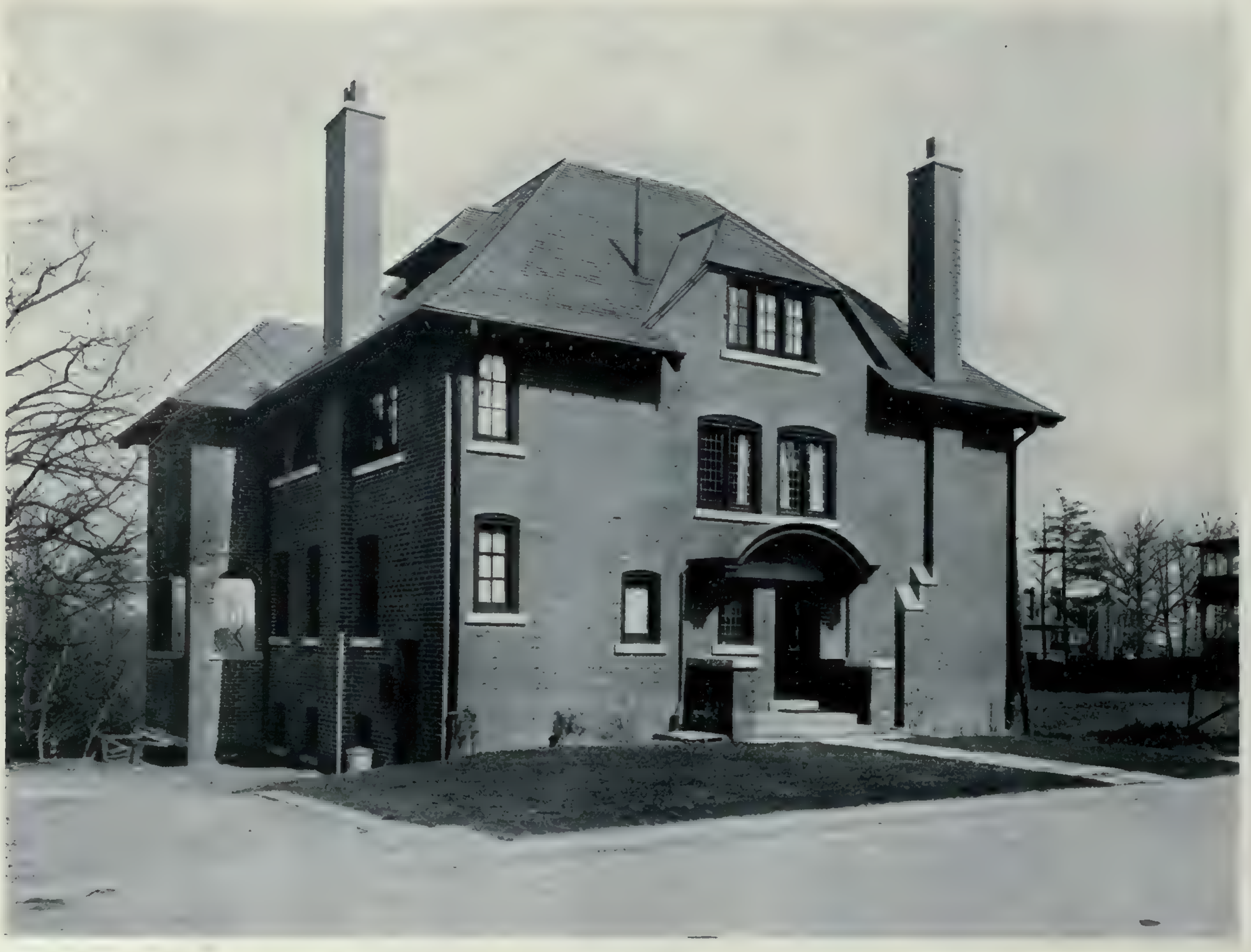
The character of the design is entirely English. The stonework is laid in coursed random rubble, with wide joints. The windows are casements and have stained batten shutters with iron strap hinges. A half round gutter on gutter supports is the cornice treatment. The roof is of Tudor slate varigated in size and colors, and a 4 in. stone facing backed with 8 in. tile form the wall construction. The chimney is a noteworthy feature and all elevations are interesting.



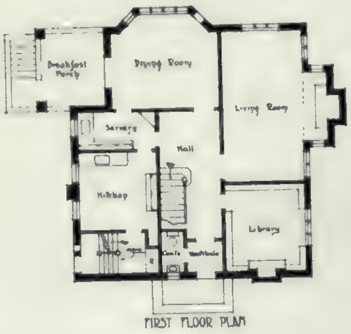
DETAIL OF ENTRANCE: RESIDENCE OF MRS. T. G. BROUGH, TORONTO.

Residence of Mrs. T. G. Brough, Toronto.

The lower storey of this house is of red stock brick, and the upper storey stucco on brick. The interior woodwork is stained brown. The house



RESIDENCE OF A. A. BOWMAN, TORONTO. EDEN SMITH & SONS, ARCHTECTS.

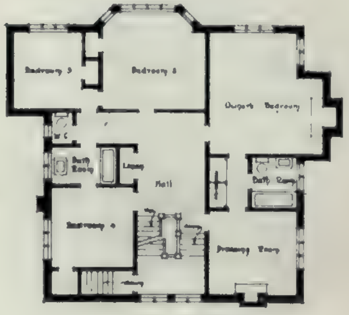


FIRST FLOOR PLAN

is designed to get as much sunlight as possible and with this end in view every room is placed on the south side, with only corridors, bathrooms, etc., on the north side. One feature of the plan is the partition between the living room and hall can be removed, giving a large floor area for entertaining. The door and chimney pieces which contribute to give the exterior an interesting character are worthy of note.

Houses on Warren and Walmer Roads, Toronto.

The Thompson residence on Warren Road is of red stock brick with Indiana stone trim. The ground floor is finished in brown stained oak, the hall is panelled, and the sunroom finished in white enamel. The upper floors trim is also in white enamel, and the bathrooms tiled. This was the first house in Toronto to be finished throughout with plaster board and gypsum plaster.

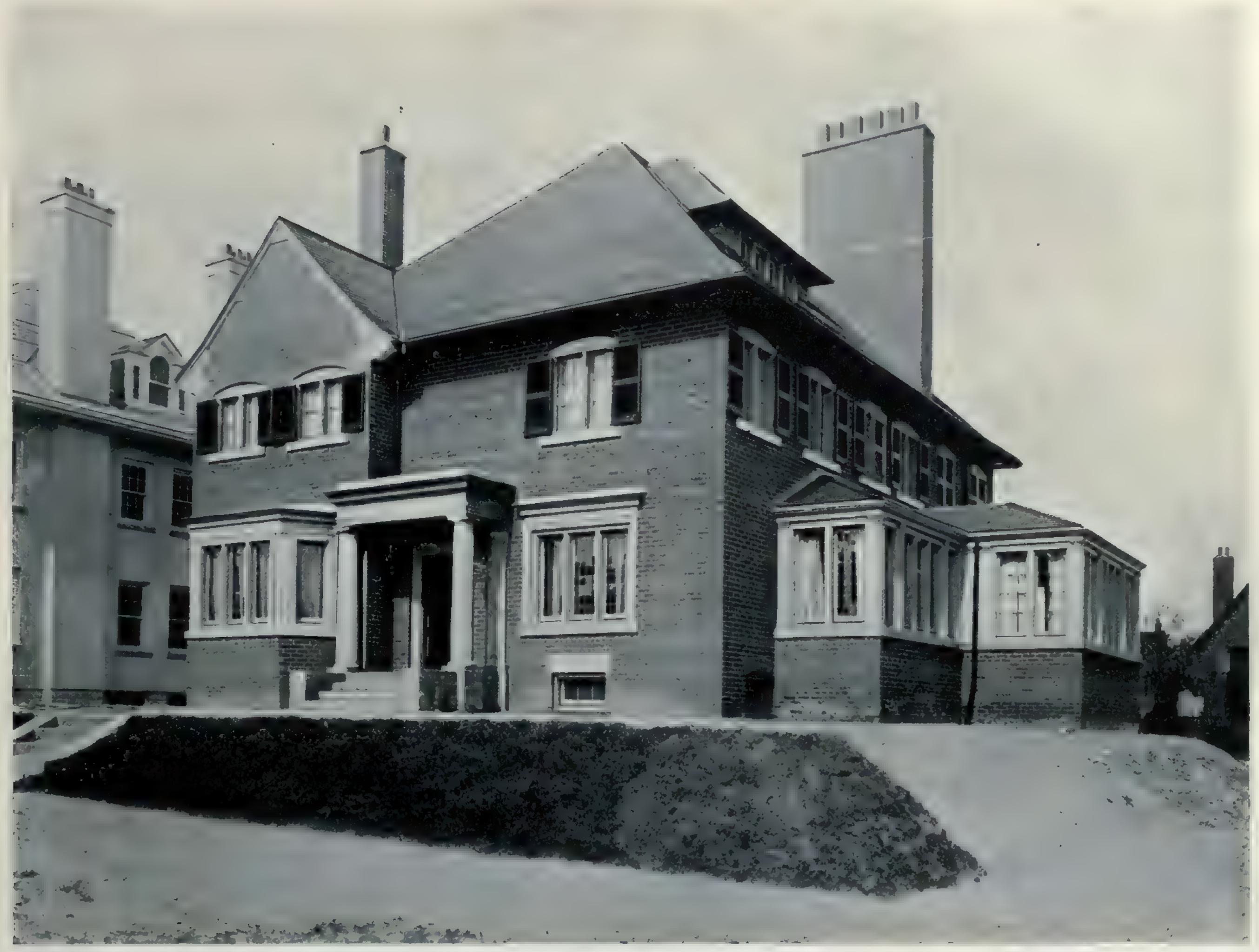


SECOND FLOOR PLAN

Gypsum plaster on plaster board is also used on the interior of the Bowman house. This has been left with the natural grey finish. In this case the exterior is red stock brick with a grey joint. The living rooms are stained and the bedrooms enamelled with stained doors. The house is situated at the end of Walmer Road with a fine view to the north-east across the ravine.

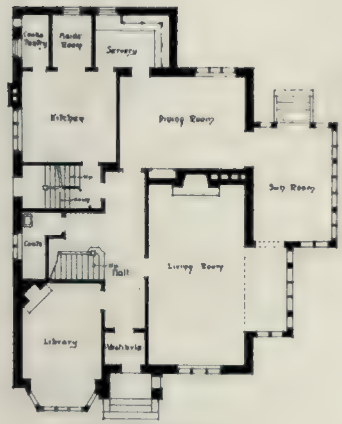
The other two houses illustrated are presented without plan. The photographic views in themselves, however, are interesting, as instances showing results achieved by the use of stucco in recent work.

In the Peterborough (Ont.) house, which is very simple in lines, the basic walls are of hollow tile, while in the John M. Bowman residence, which is a comfortable house in the farming district on the Metropolitan Radial, just north of Toronto, the stucco is on brick backing.

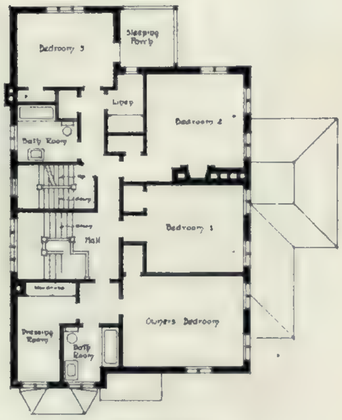


RESIDENCE OF F. C. THOMPSON, TORONTO. EDEN SMITH & SONS, ARCHTECTS.

The Question of High Building in London



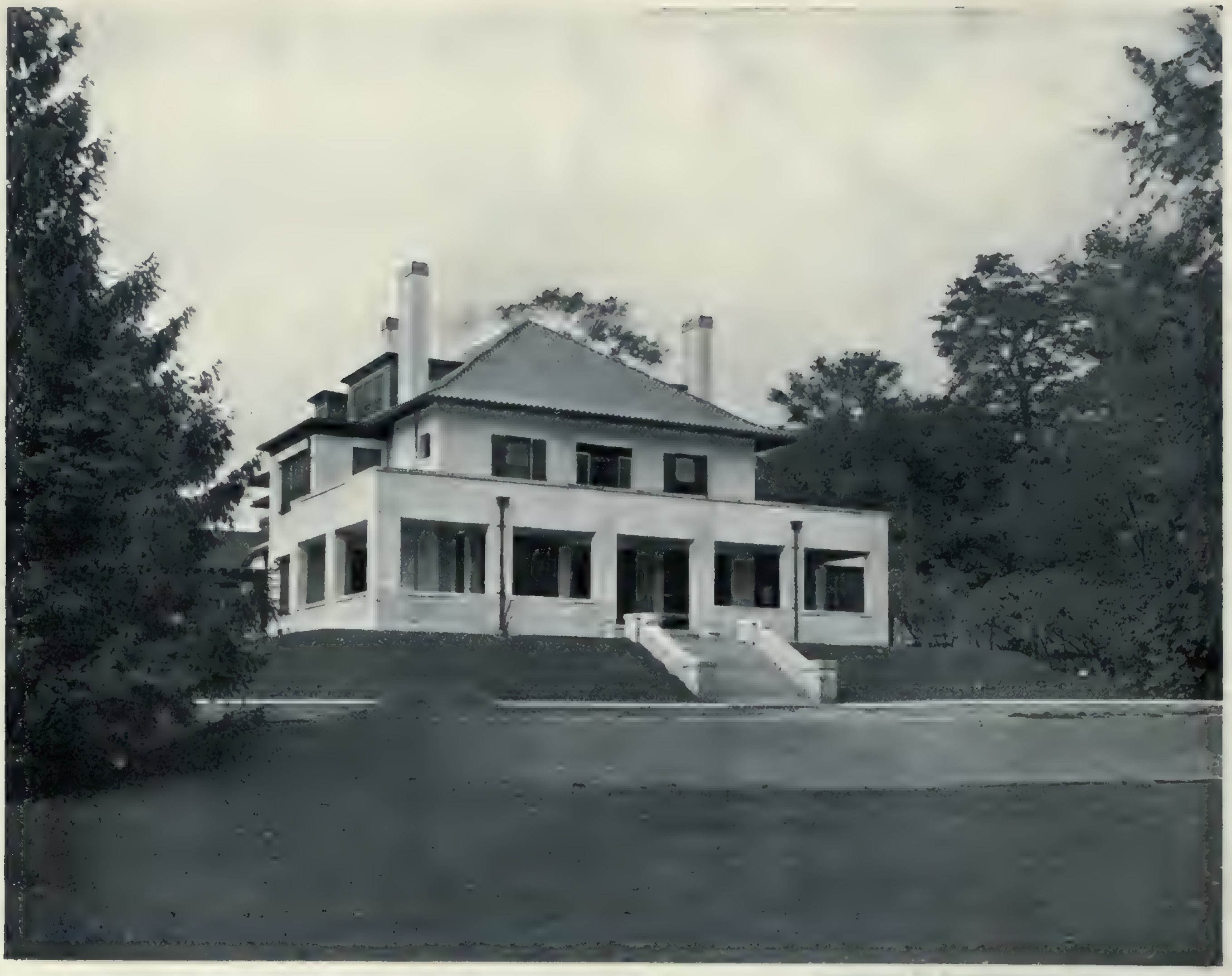
FIRST FLOOR PLAN



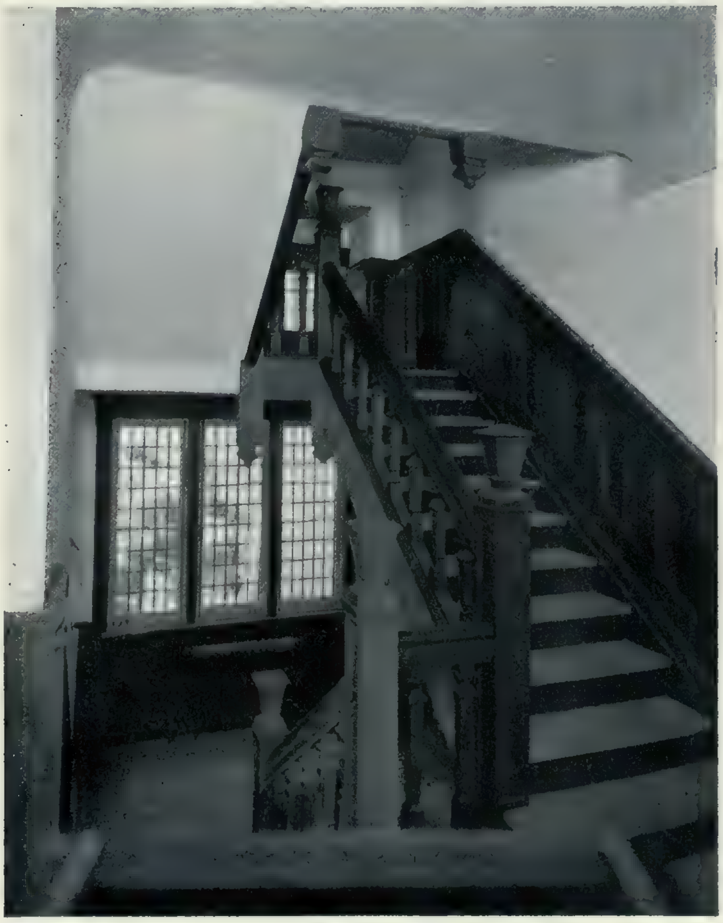
SECOND FLOOR PLAN

The question of high buildings is at the present time a live subject in London, England, and is drawing forth much comment from various quarters. The BUILDER in a recent issue issue quotes Mr. Andrew Taylor, late Chairman of the Improvements Committee of the London County Council, as being frankly opposed to the erection of tall buildings which he declares would not add to the beauty of London. In the opinion of Mr. Taylor, it was the duty of every Londoner to consider the problem carefully. As regards the artistic side of the question, he had been impressed by some of the spires in New York, which, flanked by tall buildings, were completely destroyed from the artistic point of view. The spire of a church in Madison Square was dominated by a building which adjoined it and rose to a height of two hundred feet above it. There was no more beautiful sight than a view of the City of London from the river near Westminster. There was a certain symmetry and proportion of the building, punctuated and dotted with towers and spire, and dominated by the great swelling dome of St. Paul's, which formed a very beautiful picture, but which would be spoilt by the introduction of towers two hundred feet high.

Another opinion quoted by our contemporary is that of Mr. Solomon J. Solomon, R.A., who felt that it would be a great pity to rob London of its small share of sunlight. To raise the general level of the skyline by the indiscriminate erection of buildings of more than twelve stories would have a depressing effect. However, there were places where a well chosen high building would add to the architectural effect which was



RESIDENCE AT PETERBOROUGH, ONT.
C. H. ACTON BOND, ARCHITECT.



STAIRCASE.

given here and there by cathedrals. Such building would necessarily have to be on the south side of parks or the river, so that the shadow would not fall on the surrounding buildings. If moderately high houses were erected on the south side of the Thames, it would, perhaps, encourage the inhabitants to use the river as a highway, and thus to some extent relieve the transport problem.

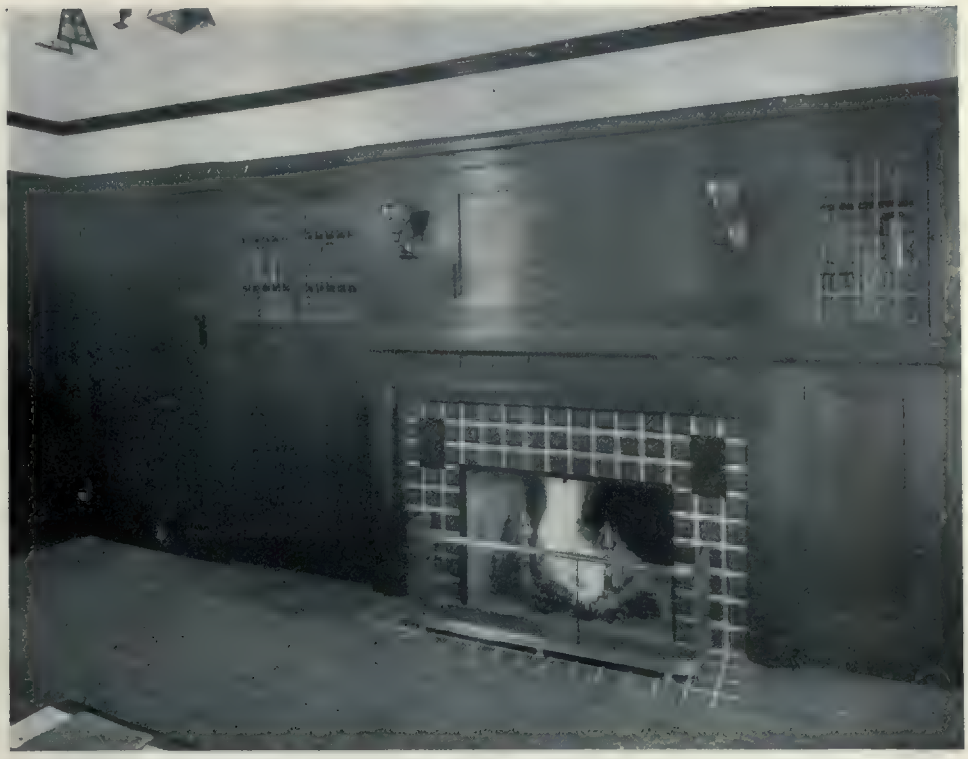
On the same subject Professor Beresford Pite states that the statistics of disease in districts where buildings were high were alarming when compared with districts where buildings were low. What was wanted was an alleviation in the height of commercial buildings, and in no other way should the height of buildings in London be altered, in the interest of architecture or anything else.

◆

Conditions in Western Cities Show Improvement

Reports from Western cities indicate an increasing volume of building work. Important developments at Edmonton include the new Marshall Wells warehouse of which the ground floor slab is now being poured. This is an eight-storey building, two hundred by one hundred feet, of reinforced concrete for which Carter, Hall & Aldinger, Winnipeg, have the general contract.

Another Winnipeg contractor, J. McDermott, has the contract for a concrete addition to the warehouse of Revillion Freres, which will add six more floors to the present three stories and increase the general dimensions to one hundred and fifty by two hundred feet., making it one of the largest warehouses in Canada.



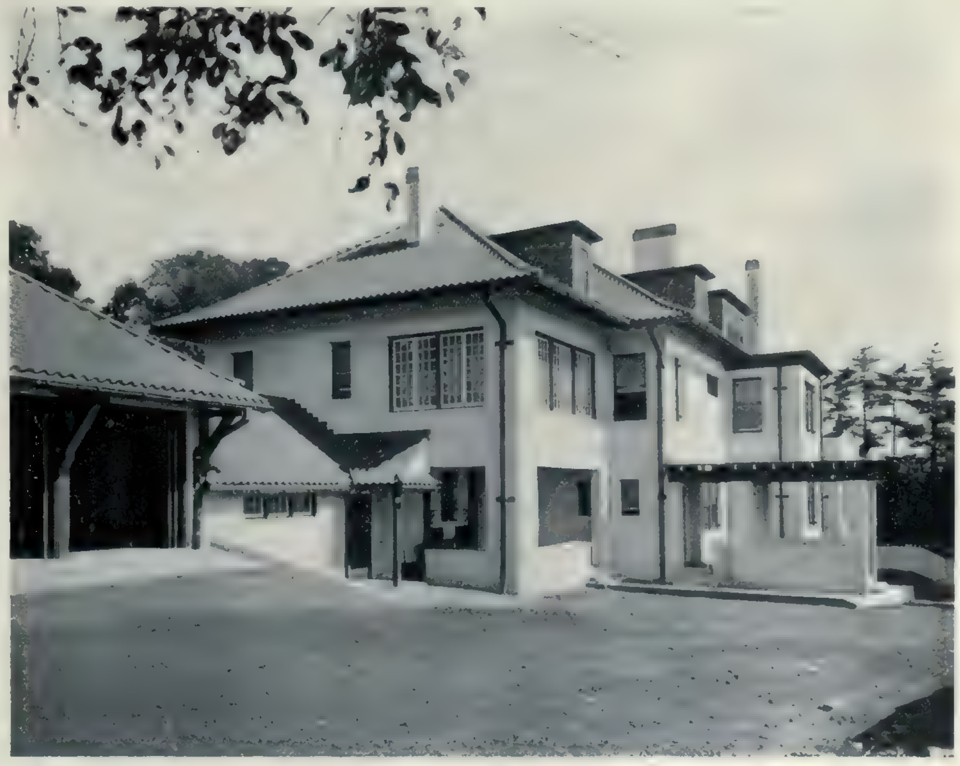
LIBRARY FIREPLACE.

In addition to this, work is under way for the new Medical Building at the Alberta University, the foundation of which is now being put in by Jameson & McKenzie, the contractors. Professor C. S. Burgess, in charge of the Department of Architecture at the University, is the supervising architect, and Professor Robb is designing the mechanical features.

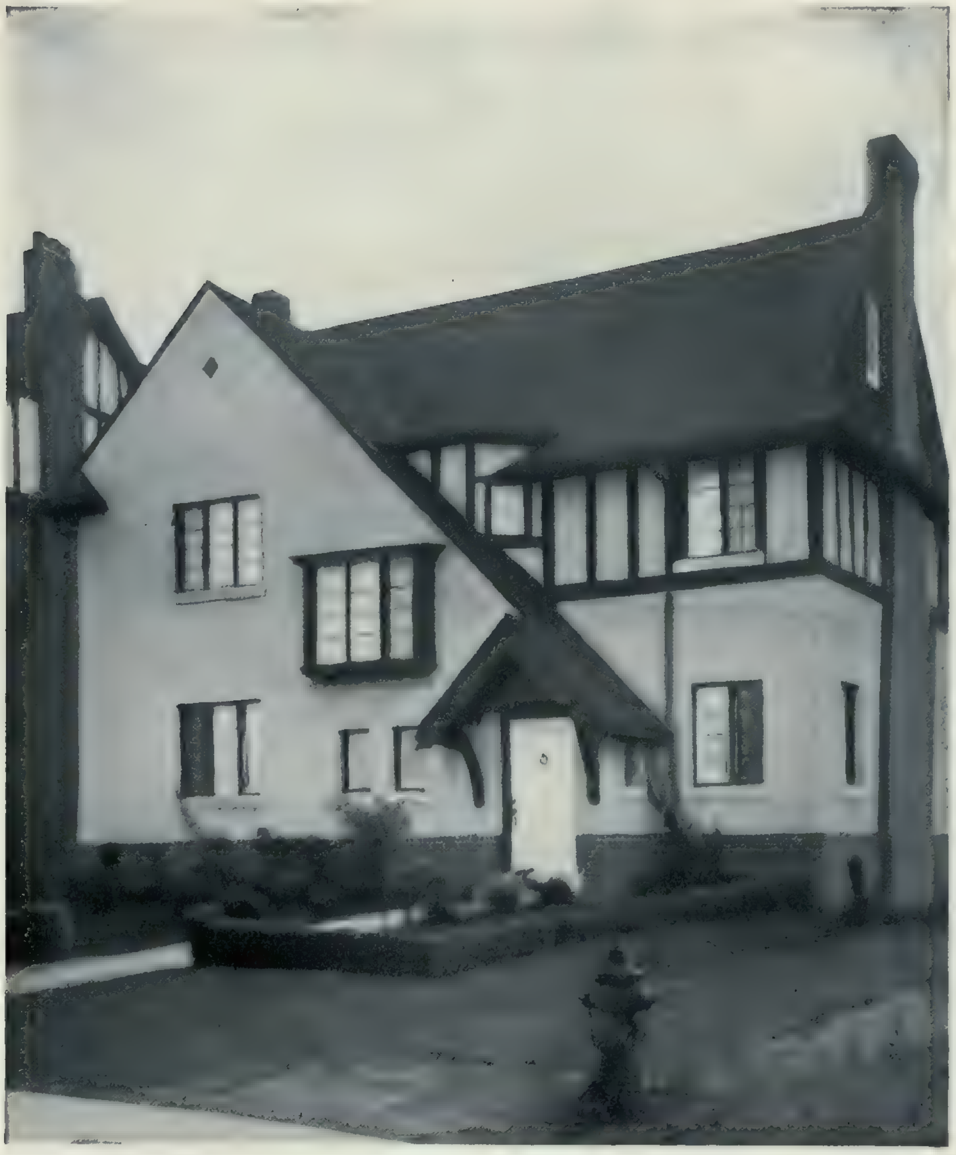
Magoon & MacDonald have also completed plans for a store building, fifty-six by eighty feet, for Mrs. J. Hetu, on Jasper Avenue.

Another big undertaking is a five-storey factory, one hundred by one hundred feet, and costing $250,000, for which a contract has been let to Harold MacDonald by the Northwest Biscuit Company. Besides this, the city is contemplating the erection of an $18,000 addition to the old fire hall and police station on Fraser Avenue; and the All Saints congregation is intending to build a new church to replace the struc destroyed by fire. There is also a considerable number of residences being built in the new Glenora section, while excavations have been completed for a new nurses' home costing $90,000 in connection with the General Hospital.

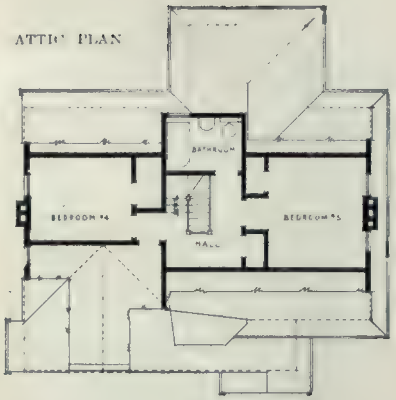
In the Province of Saskatchewan it is estimated that the expenditure for construction work this year will amount to at least twenty million dollars, of which the city of Regina will account for over $5,000,000. As regards the Province as a whole, estimated work includes a considerable number of residential projects and the erection of at least two hundred schools.



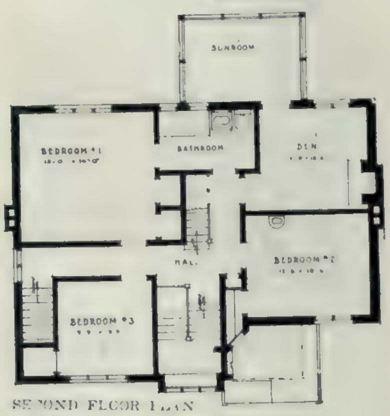
SIDE ELEVATION: HOUSE AT PETERBOROUGH, ONT.



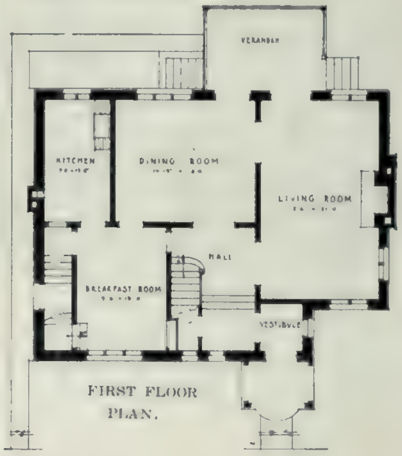
HOUSE OF THOMAS MIX, TORONTO.
MOLESWORTH, WEST & SECORD, ARCHITECTS.



ATTIC PLAN



SECOND FLOOR PLAN



FIRST FLOOR PLAN.

The largest items on the program, however, will be made up of the business blocks, warehouses and Government contracts. Among the last named are the asylum at Weyburn, the Canada Lignite Board plant at Bienfait, Government roads and bridges, courthouses, and the Prince Albert jail. Besides these, at least twenty-five branch banks will be erected this year at various points in the Province.

◆

Stratford to Erect War Memorial

Authority has been given to the Chamber of Commerce of Stratford, Ont., to proceed at once with the erection of a soldiers' war memorial to cost $25,000. The memorial, a massive one of bronze and granite, bearing the names of over three hundred of the city's honored dead, will represent the work of Mr. Walter Allward, the well known Toronto sculptor. A campaign organized at a recent public meeting which unanimously endorsed the project, is now being conducted to raise the necessary funds.

An Experimental Forest

Canadians have now been familiar for a long time with the words "experimental farm," and while the heading of this paragraph may seem a little new, a moment's reflection will show that the good work which our experimental farms have done for agriculture our experimental forests are likely to do for forestry and lumbering. The people of this country now realize that a large proportion of Canada is admirably suited to the growing of timber, but is not suited to the growing of ordinary field crops. Rough, hilly land, sandy plains and ridges, and ridges strewn with boulders are types of soils better suited to growing trees than to growing anything else. At the same time the increasing price of lumber all over the world proves to Canadians that the forests growing on these non-arable lands will continue to form one of Canada's greatest resources. In the

DETAIL OF ENTRANCE.

Upper Ottawa country and in many other parts of Canada there are districts from which a crop of timber has been taken by the lumbermen, but which have not been occupied since that time by settlers. These districts are now being covered again with a new growth of timber, but in many cases it is not as good timber as that taken off thirty or forty years ago. It is here that the knowledge and skill of the forest engineer comes in. He can by weeding out the inferior trees give the better species like pine and spruce a chance to develop and to cover the country. Details of such work have been reduced to a system in Europe, as many Canadians learned when they served in the trenches in France, but experience in regard to European forests cannot be taken as a guide in a country like Canada, where many conditions are different. To study this problem of how to reproduce good forests as quickly as possible on cut-over or burned-over lands, the Dominion Government, at the request of the Honorary Advisory Council for Scientific and Industrial Research, instructed the Forestry Branch of the Department of the Interior to establish an experimental forest on part of the military reservation at Petawawa. The tract is an ideal one, as it presents conditions as they appear over a large part of Ontario and Quebec. Three working seasons have now been spent on the experimental forest at Petawawa and already much information has been gained as to the rapidity of tree growth. With these studies continued and extended, Canadians will in years to come know as much about their forests and how to handle them as the French know about theirs.

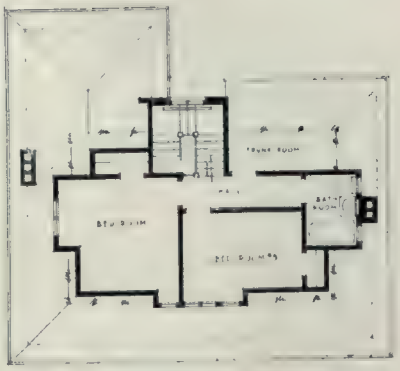
Research in Corrosion

At the recent congress of the British Institution of Metals, a valuable report was read on the corrosion of condenser tubes, a subject in which so many engineers are keenly interested. This report was the fifth of a series, recording researches undertaken by a special committee of the Institute. Experiments have been made with alloys of copper and zinc, and many suggestions made for avoiding or reducing corrosion. In the British navy trials are being made with oxidized tubes, and a British company has been formed to exploit an electrolytic process which deposits and maintains a protective layer of lime on the surface of the tube.

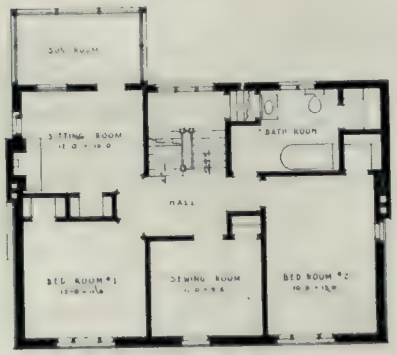
New British Garden City Scheme

An entirely new scheme for a British garden city is comprised in the program of a recently formed joint-stock company. The scheme, according to a report from the American Consul-

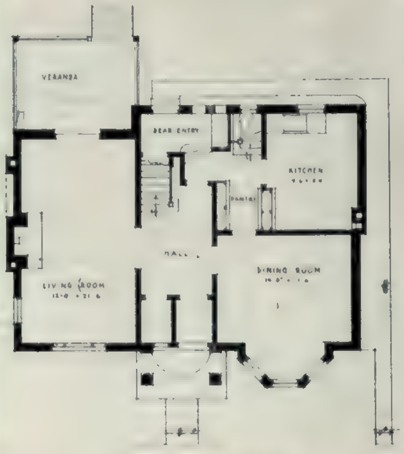
. DETAIL OF ENTRANCE.



ATTIC PLAN.



SECOND FLOOR PLAN.



FIRST FLOOR PLAN.

ate at London, covers the erection of houses where every modern improvement and convenience will be included, the servant problem solved, shopping made easy, and all profiteering banned. The actual ultimate annual rental, under the proposed plan, will amount to about £3 (say $15) per annum.

In reality the rent of a house will be £75 ($365); but against this will be offset the estimated profit of 9 per cent. due the tenant on his payment of a capital premium of £800 ($3,893), amounting to £72 ($350), thus leaving a balance for rent of only £3. It is stated that, by employing direct labor, the cost of each house will be reduced from £2,000 ($9,733) to £1,500 ($7,300). Advantages to be provided will include electric cooking, heating, lighting, and vacuum cleaning, telephone installation, central restaurant and participation in profits, and a department store, the profits of which are to be returned under a profit distribution scheme. Apart from the fees payable to the directors of the company, all subsequent profits come under the profit-distribution scheme for the tenants.

Respecting the servant difficulty, the company proposes to employ as many as may be desirable. These servants will have stated hours, freedom after hours, and good wages; and they may be hired by the tenants by the hour, part-day, or for several days weekly.

◆

Keep the Sacks at Work

The following is a fundamentally sound piece of advice of interest to cement contractors and users, which the Portland Cement Association of the United States has recently given out to the technical press for publication:

One empty sack at the cement mill is worth any number of them lying idle in dealers' or

HOUSE OF SIDNEY SMITH, TORONTO. MOLESWORTH, WEST & SECORD, ARCHITECTS.

users' hands all over the country in so far as shipment of cement is concerned. Like many other kinds of cotton goods cement sacks are scarce. If every idle cement sack in the country were returned to the plant which sent it out, there would be considerable relief of the present shortage both of cement and sacks.

Besides, cement sacks cost you money—money which is not working for you as long as you keep the sacks in your possession and thus make it impossible for the manufacturer to buy them back.

This condition is simply another one of those seemingly trifling items of neglect, that in its own way is contributing to keeping the wheels of industry from moving as regularly and as smoothly as we all would like.

If a cement plant ships 1,000,000 barrels of cement a year in sacks, 4,000,000 sacks are necessary to take care of this shipment. Under actual conditions when shipments are made every day, the cement plant at the end of a year would find itself short of a very large number of sacks because dealers or cement users have not returned all they received. The following year it would, therefore, benecessary to supplement the stock of sacks by purchasing new ones. Sooner or later some sacks are certain to be lost through neglect or because put to improper use and thereby permanently kept from being again used as cement containers. No one knows exactly what becomes of them, but if lost while in your possession, it means money lost to you.

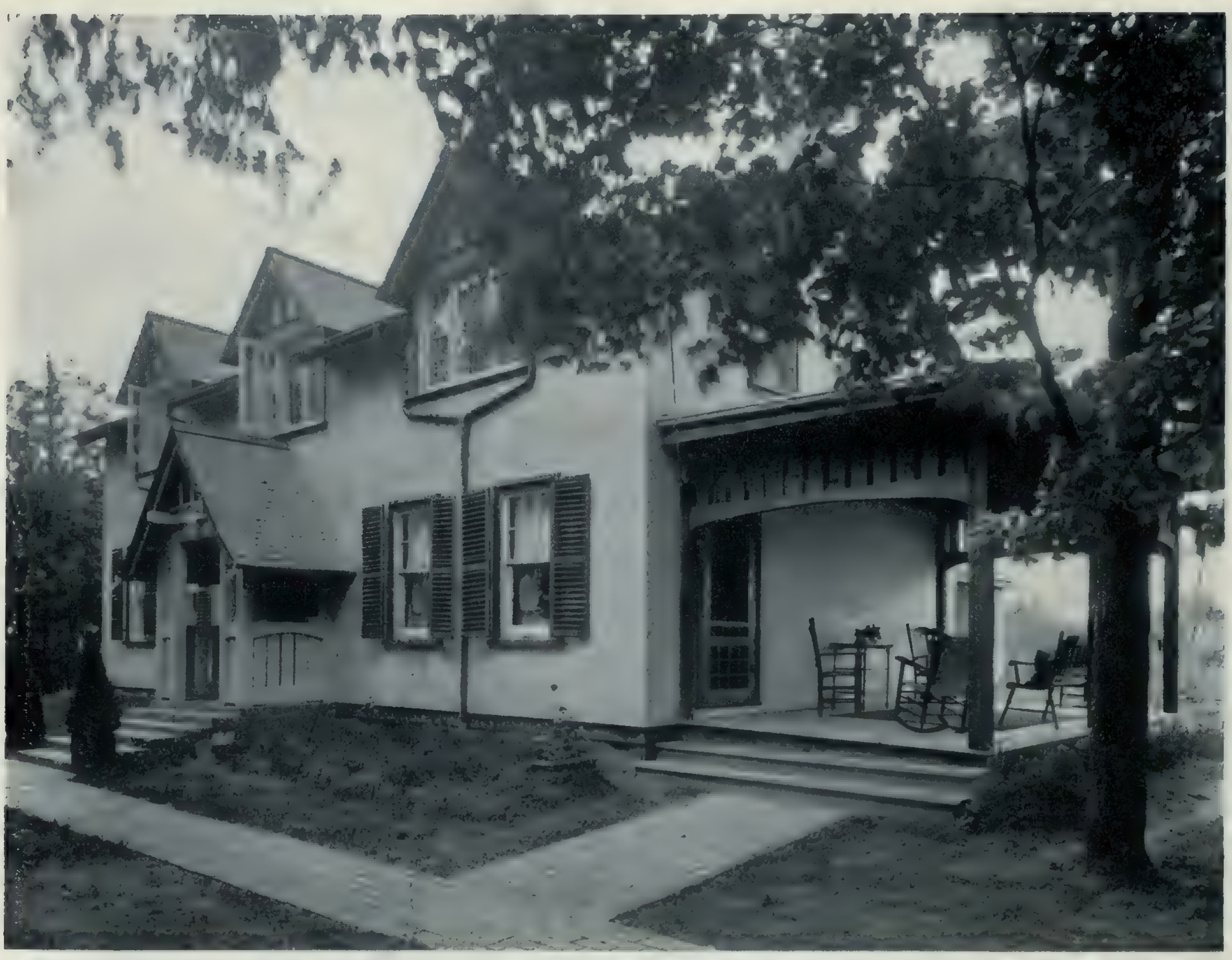
Many building and highway contractors have shown commendable enterprise in purchasing and storing during the past winter large quantities of cement in anticipation of immediate need when the construction season opens. Naturally this has temporarily prevented the circulation of many cloth sacks. Nevertheless there are enough empty sacks in users' and dealers' possession throughout the country, which, if returned to the cement mills, would make the number held out of circulation through storage of cement relatively insignificant.

Cement sacks represent an outlay of money by you until you have returned them for credit, and if they are not returned promptly, that the cement manufacturer must provide for new containers to take care of his business with you. This represents an unnecessary waste because far more containers must be manufactured and used than would actually be necessary if every cement sack was kept at work.

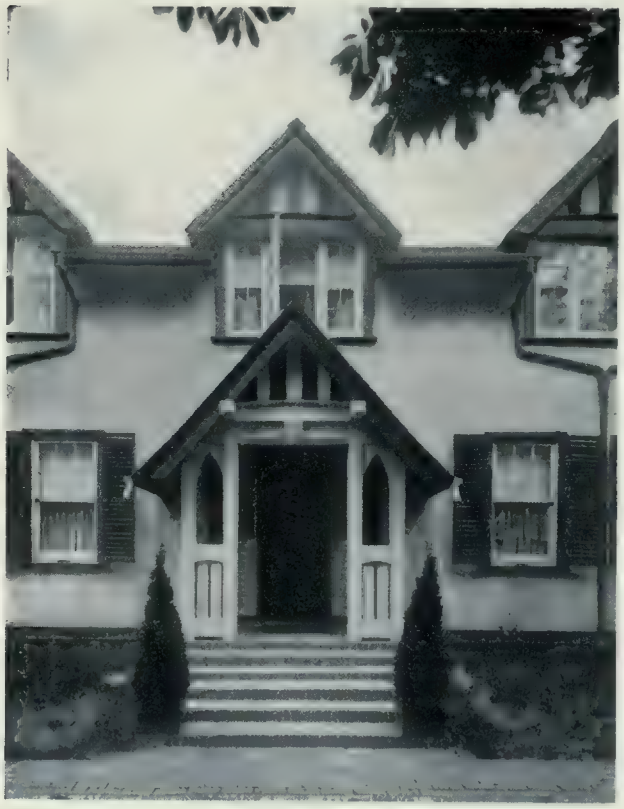
◆

R.I.B.A. EXAMINATION.

An examination of candidates seeking associate membership in the Royal Institute of British Architects will be held in Toronto next December. Those desiring further information should communicate with F. S. Baker, honorary secretary for Canada, Bank of Hamilton Building, Toronto.



COUNTRY HOUSE OF JOHN M. BOWMAN, ON THE METROPOLITAN RADIAL BETWEEN NORTH TORONTO AND BOND LAKE.
J. W. SIDDALL, ARCHITECT.



DETAIL OF ENTRANCE.

Houses

(For Aline)

WHEN you shall die and to the sky
Serenely, delicately go,
Saint Peter, when he sees you there,
Will clash his keys and say:
"Now talk to her, Sir Christopher!
And hurry, Michelangelo!
She wants to play at building,
And you've got to help her play!"

Every architect will help erect
A palace on a lawn of cloud,
With rainbow beams and a sunset roof,
And a level star-tiled floor;
And at your will you may use the skill
Of this gay angelic crowd,
When a house is made you will throw it down,
And they'll build you twenty more.

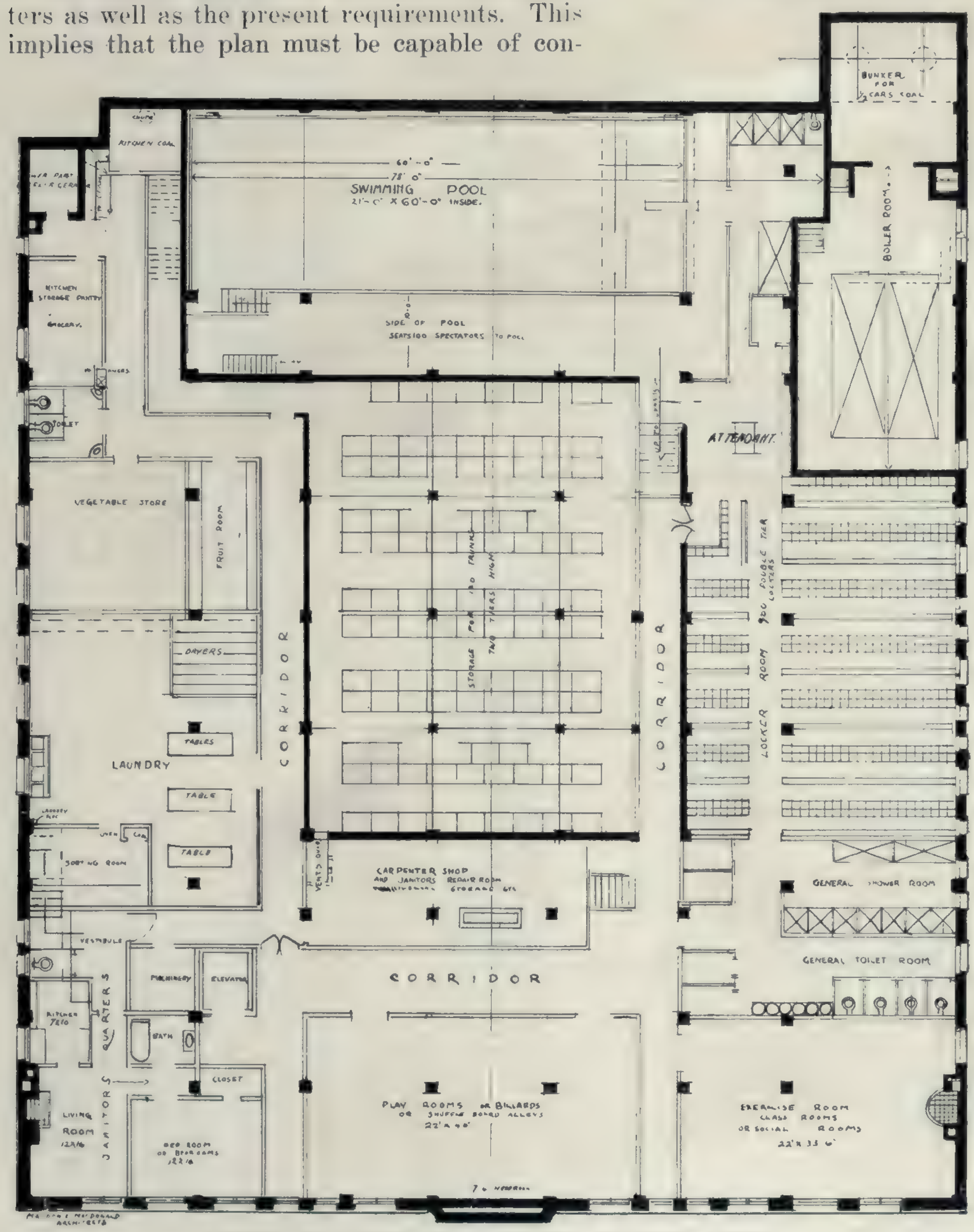
For Christopher Wren and these other men
Who used to build on earth,
Will love to go to work again
If they may work for you.
"This porch," you'll say, "should go this way!"
And they'll work for all they're worth,
And they'll come to your palace every morning,
And ask you what to do.

And when night comes down on Heaven-town
(If there should be night up there)
You will choose the house you like the best
Of all that you can see;
And its walls will glow as you drowsily go
To the bed up the golden stair,
And I hope you'll be gentle enough to keep
A room in your house for me.

—*Joyce Kilmer.*

Winning Design, Edmonton Y.W.C.A.

A permanent investment has been the watchword of the executive intrusted with the initiation of the project for the new Young Women's Christian Association at Edmonton. It has been felt that the present location amply warranted a building that would meet the needs of the city for the future as central headquarters as well as the present requirements. This implies that the plan must be capable of considerable expansion, and these requirements have been met to the fullest possible extent in the accepted plans prepared.



BASEMENT PLAN, NEW Y.W.C.A. BUILDING, EDMONTON, ALBERTA.

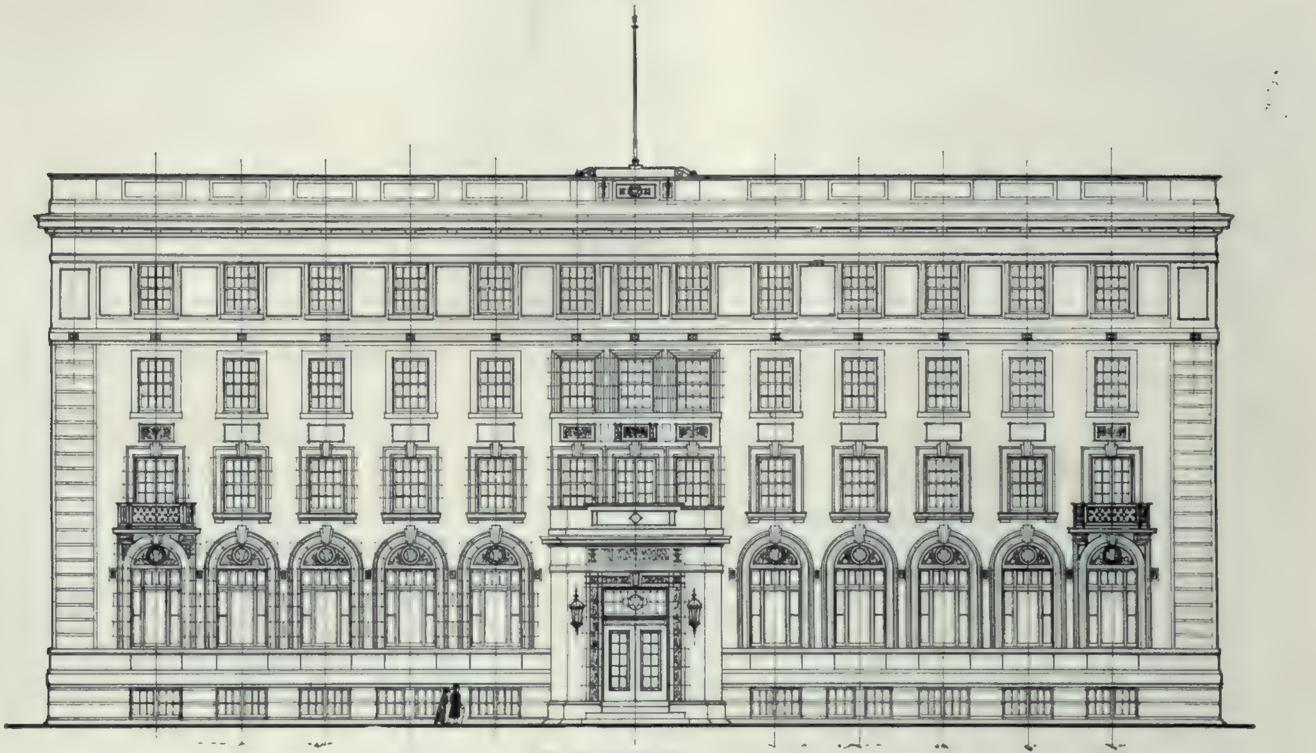
The building is to be carried out in reinforced concrete and ample provision made for maintaining light and air to all portions of the building. The site on 103rd street extends one hundred and twenty-five feet along this street and one hundred and fifty feet in depth. A terrace fifteen feet wide will be maintained across the full front of the property.

The work on the main floor divides itself into five main activities:

1st. The work of the executive.
2nd. Receptions and meetings.
3rd. Reading activities.
4th. Dining accommodation.
5th. Athletic.

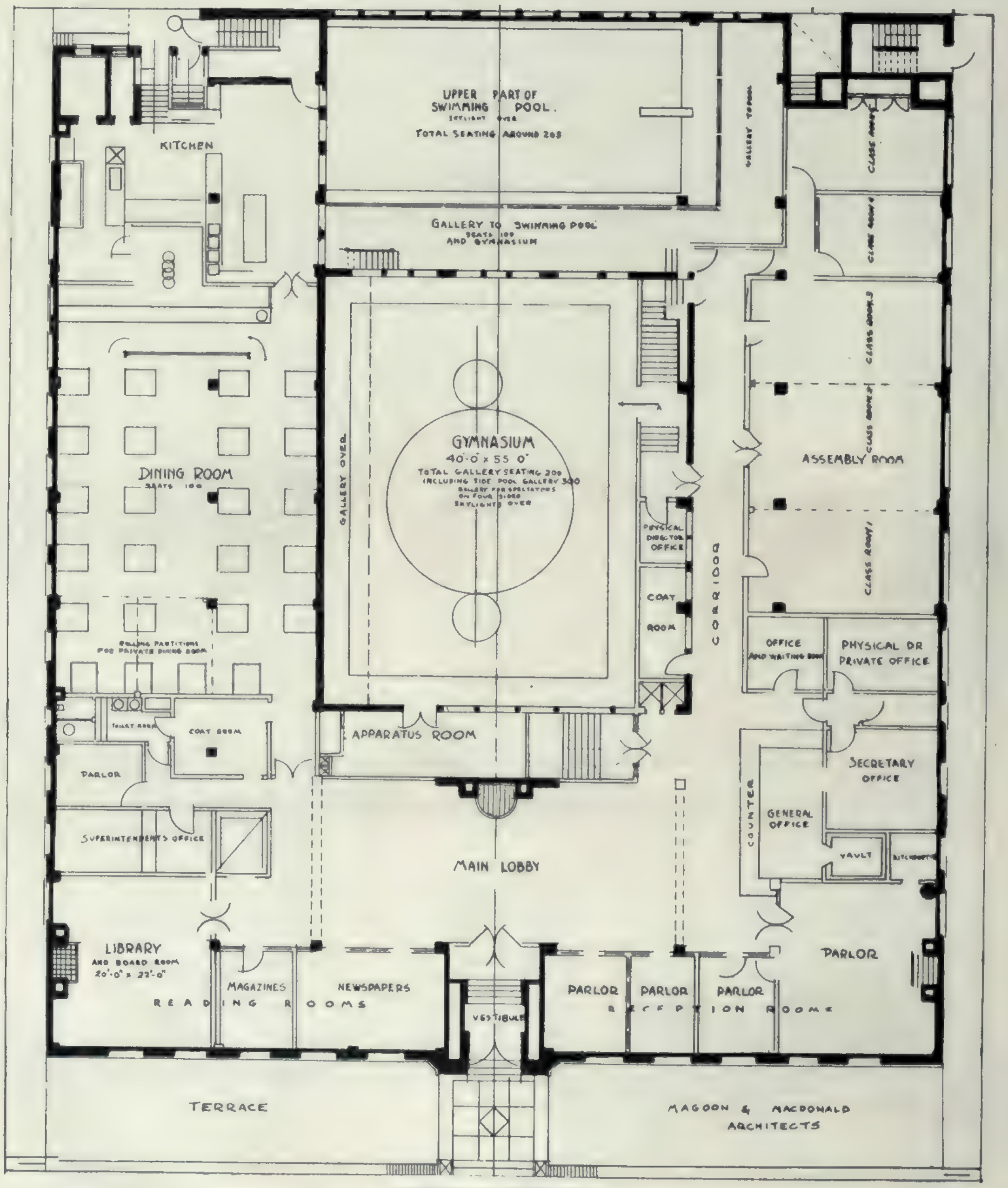
The main entrance has been placed in the centre of the building, and opens directly into the main lobby, which is twenty-two feet by seventy-two feet long, and immediately in front of the entrance is a large fireplace, which will form the centre of social gatherings and lends a cheerful and attractive aspect to the place. Immediately north of the entrance, along the front, it is planned to concentrate the reading department. This will consist of a large library, twenty feet by twenty-two feet, with a fireplace, which on occasion can be used as a board room, and which will be kept entirely free from newspapers and other loose reading matter. Immediately adjoining this will be located the magazine room and a large newspaper room, thirteen feet by twenty feet.

To the south of the entrance the reception rooms, parlors and meeting rooms have been located in two groups. The group extending along the front comprises a parlor, same size as the library, with a fireplace and a kitchenette. This room is capable of seating about ninety people, and will form the nucleus of the various social activities held in the building. Immed-



FRONT ELEVATION.

ACCEPTED
COMPETITIVE
DESIGN,
NEW Y.W.C.A.
BUILDING,
EDMONTON,
ALBERTA.



MAGOON & MACDONALD,
ARCHITECTS.

GROUND FLOOR PLAN.

iately adjoining it are three other smaller parlors, which will also be used as committee rooms.

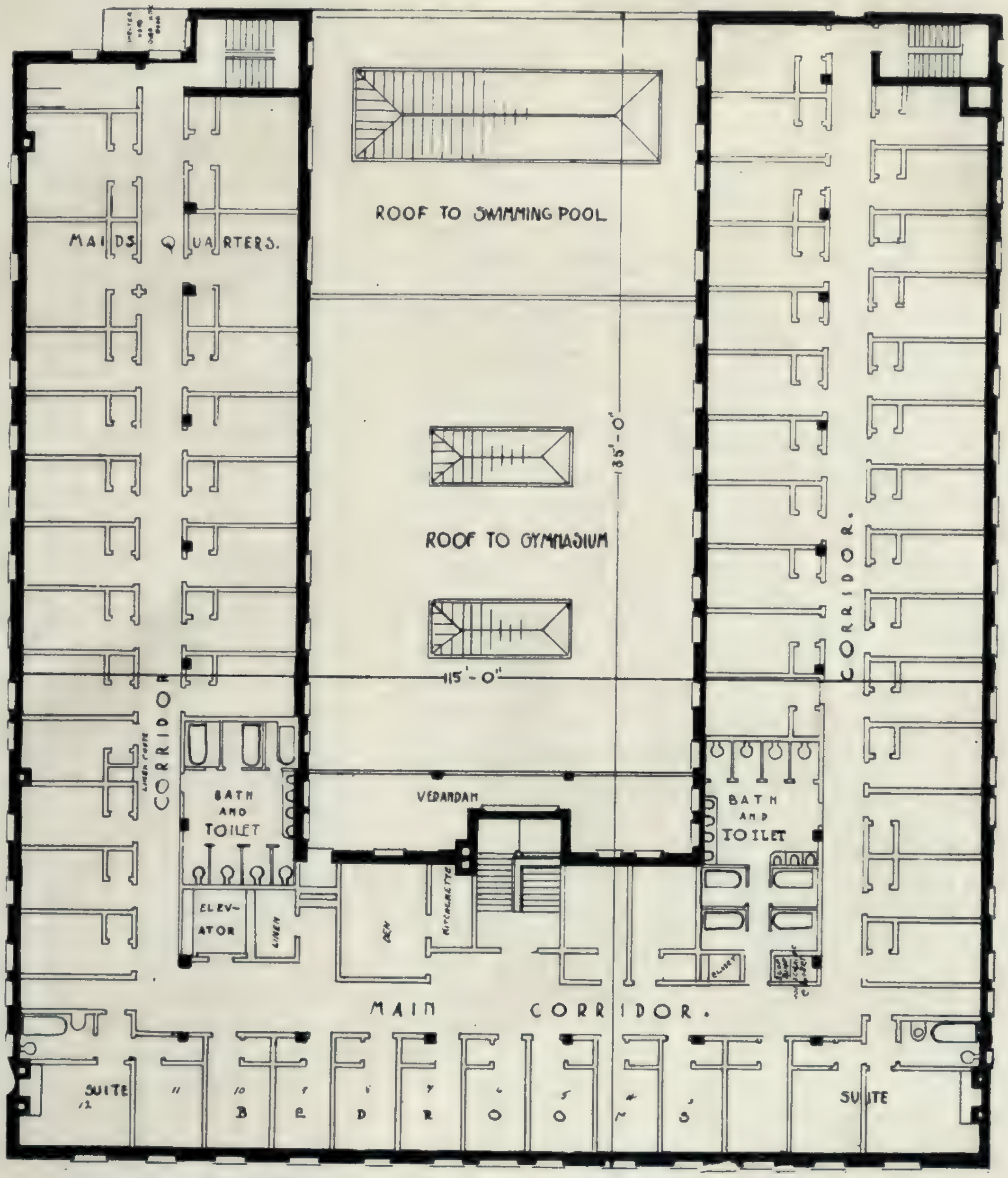
The building has been designed in the form of a "U," with front wing one hundred and sixteen feet long and two side wings extending one hundred and thirty-five feet to the rear of the property.

In the large court between the wings of the "U," and directly back of the main lobby, the gymnasium is located. This room will be forty by sixty feet with gallery accommodation on the four sides, capable of seating in the neighborhood of three hundred spectators. Directly back of this again is located the swimming pool with a gallery capable of accommodating about two hundred and sixty-five spectators.

The dining room, kitchen, coat room, toilet, parlor and rest room and the superintendent's office and elevator space occupy the north wing. Ample refrigerator space is provided for in the kitchen; the dining room will seat one hundred people, and provision is made for private dining room accommodation.

The south wing provides five large class rooms and assembly room, seating two hundred people, and executive offices.

The pivotal point in a building devoted to association work is the location and arrangement of executive offices, so that entire control can be had of all activities taking place in the building. This has been secured by placing the general office and counter at the south end of the main lobby, with a direct view of entrance to the reading rooms and library, parlors, dining room, main stairway and entrance to the class rooms, coat rooms, telephone booths, gymnasium, swimming pool and the various spectators' galleries.



SECOND FLOOR PLAN: NEW Y.W.C.A. BUILDING, EDMONTON, ALBERTA.

Immediately back of the general office and counter the general secretary's office commands a view of the counter and all the activities directly under its control, so that in the absence of the attendant, the general secretary can oversee the work, and be also in close personal touch with the members and visitors to the building. This office is of ample size so that the secretary may meet with her committees without the necessity of and loss of time incidental to adjourning to the board room or other committee rooms.

Opening off the general office space is a large vault, and connected with the secretary's office is a toilet room and coat room. Immediately adjoining this is the physical director's private office and a waiting room.

This concentrates the work of the secretarial staff so that the main executives are always in close touch with each other.

Across the corridor and opening directly into the gymnasium is the physical director's examining room and general office. This office has a direct view of the gymnasium and of the stairway to the gymnasium and the basement.

The balance of the ground floor is occupied by a gallery and the upper part of swimming pool.

As the gymnasium is located in the light court of the building, ample ventilation is secured through skylight in the roof and a plentiful supply of fresh air is provided through a row of large windows located in the west wall. The entrance to the gallery of the swimming pool is on the level of the ground floor, and this also is provided with ample skylight ventilation and windows for the admission of fresh air.

BASEMENT.

The basement activities are centred around and under the control of the attendant, who is located at foot of stair from the gymnasium, with a view through a glass partition of the swimming pool, so that she is immediately at hand to render assistance in case of accident to the swimmers. No swimmer can enter the pool without admission by the attendant. The attendant also has a direct view down the locker room and a view of the entrance to the general shower room and general toilet room. It is the intention to instal a locker system which involves the securing from the attendant of a basket and key to the locker, towel, and possibly a bathing suit. The lockers will be the most modern type, in double tier, and providing a maximum locker requirement for seven hundred. The swimming pool is twenty-two feet wide by sixty feet long, lined with tile and with a spring board located at the deepest end, and a shower room opening directly off this. The spectators' space at the side of pool is ten feet wide, with a gallery above the same width. The pumping plant will be located at the end of the pool in direct connection with the boiler room.

The space under the gymnasium is occupied by a large trunk room, divided into two rooms for permanent and transient roomers' trunks, and with a private connection with the rear of the building and the service stair.

The basement corridors have windows located directly at the ends so that they will have ample light, and as the ground floor is kept at sufficient height the maximum light will be secured for all the basement activities.

The front of the basement is occupied by several large exercise and play rooms; the janitor's quarters being placed in the northeast corner, with a separate outside entrance.

In the basement of the kitchen wing, the laundry, drying room, sorting room, various store rooms, pantries and toilets are connected with the kitchen and conveniently located, as is also the kitchen coal room directly at foot of service stair.

UPPER FLOORS.

The three upper floors are devoted entirely to bedroom accommodation. The main stair leads directly up from the lobby in front of the general office and desk and lands directly in the main corridor to the centre of the front wing. On the landing, halfway up, is located a large mezzanine gallery and tea room, which extends across the end of the gymnasium. This gallery by means of casement windows will open directly into the upper part of the main lobby and will afford a view at the same time of all activities in the gymnasium, and will be a vantage point from which receptions occurring in the main lobby may also be viewed; it is connected with the dining room by means of dumb waiter service.

At head of main stairway on each floor is located a kitchenette and den, so that the roomers may gather here and refresh themselves, if desired. There is also on each floor a large verandah extending across the entire width of the light court. Suites, consisting of a bedroom, parlor and bathroom, for the use of secretaries and visitors are at each corner of the front wing. The general toilet rooms and bathrooms for each floor are located at the two interior angles of the light court, and in direct connection with the service stairway are four large maids' dormitories. The main corridors of the upper floors will also be served with dumb waiter connection from dining room service space.

The building has been designed so that the bedrooms are all single rooms, each with a closet three feet square, and there are in all one hundred and eighty-two bedrooms. An infirmary, consisting of a two-bed ward with toilet accommodation; a nurse's room and kitchenette, well isolated, has been placed on the top floor in close connection with the dumb waiter and service stairway.

The construction will be fireproof with the minimum use of wood, and the main front executed in tapestry brick.

British Tidal Power Scheme

The Ministry of Transport in Great Britain is giving careful attention to the possibility of building a dam across the estuary of the Severn in order to generate electric power from the tidal waters. The Ministry has also formed a strong committee to examine the ambitious schemes for electrification put forward by several British railway companies and to lay down principles which will lead to uniformity in electrical and mechanical matters so that through running will eventually be feasible.

Trimstone and Building Ornaments[*]

By Adolph Schilling.

FIFTEEN years ago, when I started to make concrete attractive and pleasing to the eye, I accepted as definitely settled concrete's claim for strength and endurance, demonstrated by the engineers in their work of that time and by the examples of ancient concrete work still in existence, some of it dating back two thousand years.

My researches and experiments have been devoted entirely to giving concrete the attractive and artistic qualities which would make it interesting to the architect and decorator as a medium for embellishment and actual construction in their work. If, for this reason, my remarks are of less technical interest to engineers and contractors for monolithic concrete construction, I ask their indulgence, to consider concrete for a few minutes more from the esthetic than solely from the standpoint of utility.

Twenty years of practical experience among the natural stones used in monumental and building work enabled me to realize the conditions that must be met, to give concrete a place alongside of the limestones, marbles, granites and clay products in which the architects had expressed their thoughts almost exclusively.

In the making of concrete, after once thoroughly understanding the qualities of cement as a binder or matrix, one can learn to adopt many mineral and metal resources as readily as we employ the better known sand, gravel and crushed stone for aggregates.

BUILDING TRIM.

After proving to my own satisfaction that cast stone could be made successfully, it required considerable missionary work to convince the architect of its merits and advantages for use in building construction and enrichment of design, so far claimed by terra cotta, natural stones, faience, etc. The many examples of cast stone executed during recent years give ample proof that the confidence of the early pioneers in the possibilities of high-grade concrete products was well founded.

Cut cast stone has been specified by progressive architects for high-grade buildings in many localities. The field has been opened and it now rests with the individual and joint effort of everybody producing concrete units for building purposes to convince the architect, engineer and contractor that standard concrete products are what they want and can get, no matter if it is for the foundation or for the richly ornamented entrance of the work in hand. It must be our purpose to establish co-operation that offers dependable concrete products *to meet the requirements* of the building trade in quality and quantity.

To cover the methods of manufacture in detail would exceed the limit of this report. We have successfully used plaster, glue, wood, sand, cement and steel molds. More general information regarding the use of same will be made available by me to anybody interested.

A kind of mold extensively used in our plant is made of channel irons, in sizes from two inches to eighteen inches wide, and in lengths from four feet to eight feet. If set on level tables or benches, the main part of a mold is provided that offers great flexibility in its use; the channel irons are held together by different length rods at the ends; wood or plaster inserts, plain or molded, determine the width, length and design of the unit to be cast. The work is poured with finished face down and can be solid or hollow, surfaced with special matter on any one side or all four sides, if the volume of the stone makes it more economical to use a core of less valuable aggregates.

Some excellent work has been done modeling directly with cement mortar by artists who have attained their efficiency in this method abroad; the most important work of this kind, to my knowledge, is a group of the Crucifixion of heroic size, at Lynn, Mass.

The artist builds up his design with permanent skeleton frame work, similar to modeling in clay. Around this skeleton he forms a rough outline of the design in wire cloth or expanded metal, and on this is placed a scratch coat of cement mortar on which when set he begins to model the final outline of his design. The artist is enabled, by using mixtures of quick and slow setting cement mortars to regulate his medium. In this way he can give the work the same freedom and spirit as if he modeled in clay, producing any texture desired; color effects can be obtained at random by using colored cement of various shades; for instance, a garland of flowers can be modeled in their natural colors. There is no difficulty in producing in cement the well-known Della Robbia effects, the same as is done in faience and colored marble. This method is particularly of interest and value where only one piece of a large ornamental design is to be used, thus avoiding the expense of molds and setting the cast in place. It also prevents unauthorized replicas of original designs, so annoying to the artist when he finds his conception misused.

For treating of surfaces we use electric rubbing wheels to produce a smooth finish, acid for grain texture finish, and any of the tools used in the natural stone trade for cut finishes, according to the effect desired in the cast stone;

---

[*] Address delivered before the recent National Conference on Concrete Housing.

any one or all treatments may be used on one piece. We have transportable rubbing and tooling machines to surface the extra heavy casting, and stationary machines for the smaller units. A cutting plant for natural stone is an ideal foundation to start an up-to-date cut cast stone business, even to the use of its rubbing beds and gang saws.

Concrete of proper age can be treated just like any natural stone, using the same tools and machinery to dress its surfaces, or to saw cast blocks of large size into slabs and strips. It is my strong conviction that the success of concrete stone for building purposes rests in a close affiliation of the stone caster and the stone cutter. Only in this way will we be able to give concrete proper texture and the necessary qualities of dimension stone, so essential to the architect and builder for durable and attractive construction.

The addition to every concrete products plant of skilled stone cutters would be a source of profit and also result in better work. The stone cutter is trained to have dimension stone true to size and shape. The average worker in cement or concrete does not appreciate this essential point, but it is all-important with the architect and general contractor. The services of a stone setter will enable the concrete products plant to set its own work, which is very desirable for the best results. We found the brick or natural stone mason did not give composition stone the required care when setting same, for reasons of trade jealousy, but once this fraternity understood that concrete stone gave extensive employment to stone cutters and setters, their antagonism vanished as they realized their own benefit in the broader use of cast stone. Whenever the opportunity presents itself, I strongly recommend closer affiliation of the composite and natural stone trades. The enormous increase in all building operations of whatever class and the constant effort for betterment in the moderate-priced home, give abundant field for both trades in a more permanent class of work and at more satisfactory profits.

It has taken many years to bring the craft of dressing natural stone to its present efficiency. The progressive concrete products man should study these methods and benefit by the experience of the trade whose product he must equal or better to meet approval by the architect.

To the manufacturer or worker of concrete products I further recommend the adoption of such methods as are employed successfully in other lines of manufacture in treating the surfaces of their product. In many cases instead of applying paint with brush, the article is immersed in the paint. This method can be adapted to acid washing of the concrete products, to remove the surface film and expose the aggregates. Tanks of sufficient size are not a hard matter to construct in the concrete shop, and

Photo courtesy of the Architectural Bronze Department, Canadian Wm. A. Rogers, Limited.

Oiler **Blacksmith** **Puddler**

CAST BRONZE STATUES FOR THE CANADIAN WAR RECORDS MUSEUM, OTTAWA.

Miss Florence Wyle, Sculptor.

the immersion of concrete products in acid solution will not only prove a great saving of acid and labor, but produce a class of work that cannot be obtained with the scrubbing brush. We use two rectangular tanks four by four by sixteen built of cement slabs, grooved and bolted together, and six circular wood tanks seven feet diameter and from two to four feet deep. Concrete should be from two to three weeks old before treating in acid bath; duration of bath depends on age of the stone, and if rough or fine texture is desired, the time being from one to ten hours. A solution from one to twenty up to one to ten is recommended, and after the article is put in the tank the solution does the rest. This style treatment preserves the edges and details of the design and makes the surface uniform. Any of the hard spots not sufficiently affected by the acid bath can be treated separately after the article has been flushed with clean water. Care must be taken that the aggregates of the surface are nearly uniform in hardness, or the acid will destroy the soft portion before the harder particles have been cleaned of the cement coating. I have had some very fine work spoiled where, to obtain a certain effect, I mixed black marble (a limestone) and crushed granite. The acid bath left only the holes where the black marble had been, while the granite showed a very fine texture and natural color. Judicious handling of this effect can produce desired results in texture, like Travertine stone, etc.

To produce color effects we may use gray or white Portland cements, separate or mixed in certain proportions, adding to this suitable pigments, but in such cases the natural colored aggregates, sand, silica, pebble grits, marble and granite, will give excellent and more uniform results. It requires great skill and care to properly mix cement and color pigments without reducing the strength of the cement and still obtain good color effects.

The importance of mixing the pigment thoroughly with the cement, before adding the aggregates, should be understood before attempting to make concrete in colors successfully on a large scale.

As a very simple method to test the proper amalgamation of the pigment with the cement, take a handful of the dry mixture and press it under a sheet of stiff paper; this will produce an even surface of the material, and when this surface does not show absolute uniformity in color the mixing is incomplete. If small specks of color show under this test, these same specks of unassimilated pigment will appear in the finished concrete. So far a very important factor that can be utilized for coloring concrete or cement has been given little or no attention; while very simple in its primary action, the successful application requires thorough understanding of the principle and medium employed.

This refers to the absorptive qualities of concrete during its stage of curing and seasoning, which offer opportunities for coloring concrete

Photo courtesy of the Architectural Bronze Department, Canadian Wm. A. Rogers, Limited.

NOONTIME IN A CANADIAN MUNITION PLANT

Cast bronze bas relief panel, 6 ft. 6 ins. x 2 ft. 11 ins., representing the work of Miss Frances Loring, a Toronto sculptor, who together with Miss Florence Wyle of that city, is executing a series of statuettes and panels for the Canadian War Records Museum, Ottawa, consisting of industrial subjects depicting activities in the munition works of Canada during the war period.

products by capillary action. By this method the color is deposited into the pores of the surface, amalgamating with the concrete into a permanent unit. The possibilities of this treatment are unlimited if based on knowledge of coloring values and good judgment not to impair the strength requirements of concrete. Coloring solution can be made to penetrate the surface of concrete six inches or more, if the object is immersed while in a very green state, but it is rarely necessary to penetrate more than one-thirty-second to one-eighth of an inch; this thoroughly fills all pores, gives the desired color effects and is less expensive. Every atom of coloring absorbed by the concrete reduces the strength of the solution; and as some of the coloring matter used is quite expensive, good judgment to allow only the necessary absorption of coloring matter is advisable from an economic standpoint. The sulphates of copper and iron are the most suitable to make solutions to color concrete by the capillary method.

Concrete can be so treated after it is a week old. When used in construction and carrying loads it should not be subjected to the coloring bath until the concrete has attained its required strength, as the filling of the pores in the concrete retards the action of hardening. Coloring by absorption is effective on concrete after it comes out of the mold or after being treated with tools. Surfaces that have been colored by absorbing mineral or metallic colors become more weatherproof and the action of the weather on the metallic colors increasing the beauty of coloring by the usual oxidation noticed on bronze and copper. Concrete treated by this method becomes so hard and dense that it will take a polish. I have treated its surfaces in the same manner as marble, granite and metal under polishing or buffing machines.

Wet cast concrete products, such as flower pots, vases and boxes, will hold water after the second day of casting and become so hard that when struck with a hammer they ring like a metal bell; waterproofing compound helps, but is not essential to obtain this result. I consider that the thorough mixing of the proper amount of cement and water with graded aggregates is all-important. Extensive tests made during the past three years with commercial waterproof paints produced excellent results. Common concrete can be made very attractive by one or two coats, and applied in stipple fashion, it will not impair the grain or texture, avoiding the undesirable appearance of brush-painted stone. This method is especially to be recommended for dry or semi-dry tamped concrete work, the porous surface readily absorbs the waterproof liquid and thereby allows the pigment particles to fill the pores.

By using spraying machine the color effect is obtained most economically. It gives a uniform color or can be varied to give the richness and depth of shading that results from this treatment in experienced hands. It can be applied where immersion is not practicable. I have obtained two and three color effects by painting certain parts of an object before subjecting same to the coloring bath. The parts so colored would not be affected by the color in the bath, the absorptive quality having been neutralized.

The artistic possibilities of such treatment are only limited by the color sense and taste of the craftsman. Using certain non-absorptive aggregates their natural color can be retained, while the absorptive parts, especially the cement mortar will assume the desired color. Precaution must be taken in the use of acid washing before immersion in the color bath as the chemical action of the acids is liable to counteract the color values of the bath. Acid should not be employed after concrete is treated with colors.

Long practice and tests will give the full benefit of this process.

In the matter of surface finishes, considerable headway has been made and most of the methods are well known to the progressive concrete man. Many are so simple and inexpensive that concrete need not remain unattractive to the architect.

Most of our trim stone and ornamental work is wet cast, it is required to stay in the mold from twenty-four to forty-eight hours, and we use a four per cent. solution of calcium chloride for our mixing water; during cold weather our shops are steam heated and kept at a temperature of seventy degrees.

We do not use curing rooms, but for quick hardening use high pressure steam cylinders six feet in diameter and seventy feet long. We have commercially verified the tests made some years ago by the U.S. Bureau of Standards and reported in Technologic Paper No. 5.

While these tests did not exceed eighty pounds pressure, we have hardened concrete with one hundred and fifty pounds steam pressure, obtaining results so that concrete two days old could be tooled under rapidly revolving carborundum wheels, cutting flint aggregates without pulling out or fraying the edges. The mixtures used were from one to ten to one to five. Compression tests showed over four thousand pounds in two days and absorption less than five per cent. The higher the steam pressure the less time it requires to harden. With one hundred and fifty pounds we reduced the time to four hours, besides the two to three hours it requires to bring the pressure up to one hundred and fifty pounds. Concrete so hardened has been subjected to weathering for

(*Concluded on page 200.*)

CONSTRUCTION

A · JOURNAL · FOR · THE ARCHITECTURAL
ENGINEERING · AND · CONTRACTING
INTERESTS · OF · CANADA

H. GAGNIER, LIMITED, PUBLISHERS
Corner Richmond and Sheppard Streets.
TORONTO - - - - CANADA
M. B. TOUTLOFF, Editor

BRANCH OFFICES:
MONTREAL—171 St. James Street.
E. R. Milling, Representative.
WINNIPEG—336 Qu'Appelle Street.
F. C. Pickwell, Representative.
NEW YORK—505 Fifth Avenue.
H. M. Bradley, Representative.

CORRESPONDENCE.—All correspondence should be addressed to "CONSTRUCTION," Corner Richmond and Sheppard Streets, Toronto, Canada.

SUBSCRIPTIONS.—Canada and Great Britain, $3.00 per annum. United States, the Continent and all Postal Union countries, $4.00 per annum, in advance. Single copies, 50c.

ADVERTISEMENTS.—Changes of, or new advertisements must reach the Head Office not later than the twentieth of the month preceding publication to ensure insertion. Mailing date is on the tenth of each month. Advertising rates on application.

CONTRIBUTIONS.—The Editor will be glad to consider contributions dealing with matters of general interest to the readers of this Journal. When payment is desired, this fact should be stated. We are always glad to receive the loan of photographs and plans of interesting Canadian work. The originals will be carefully preserved and returned.

Entered as Second Class Matter in the Post Office at Toronto, Canada.

W. H. HEWITT, Business Manager

Vol. XIII Toronto, June, 1920 No. 6

Battlefield Memorials

The report of the special committee appointed to consider the question of erecting battlefield memorials in France and Belgium to commemorate the gallantry of Canadian troops, indicates that the matter is being dealt with in the right way. There at least seems to be a concurrence of opinion among the committee that the proper procedure is to hold a competition among Canadian architects, sculptors and artists, with professional assessors to draft the conditions and make the award. The recommendation is that an open competition be held, followed by a limited one, in order to select the most suitable designs.

The importance of the project and the great purpose it represents make it necessary that it should be carried out under the very best auspices. Professor Percy E. Nobbs of McGill University, who has been advising the committee and who has made many valuable suggestions, strongly urges this as a condition necessary to the successful development of the undertaking. His recommendation is based both upon a broad architectural experience and a knowledge gained in overseas service which has familiarized him with the battlefield area and makes him a most competent authority on the subject. Indeed the history of all public undertakings in which architecture is concerned shows that where professional assessors are not appointed and the conditions of competition properly prepared the outcome is disappointing. As the report points out, there will be so many monuments in France that it is important to have a distinctive Canadian type. Whether the project assumes the form of eight separate monuments governed by a ruling type, or comprises seven monuments with one dominating scheme, in order to be really interesting in character they should be distinctive in matters of detail, and therefore represent the work of different architects. The best way to assure this is to bring the work under competent direction and supervision along lines which the report suggests. It is therefore to be hoped that the recommendations made will be endorsed and accepted by the Government, for it would indeed be unfortunate if our efforts in such an enterprise should suffer by comparison, or so worthy an object fail in final results.

◆

The New Tax and the Building Industry

The following ruling has been issued by the Inland Revenue Department, Ottawa, respecting the new budget tax as it affects the building industry:

"Contractors and sub-contractors will have to pay 1 per cent. tax on materials used by them.

"Products of the soil, such as sand, gravel and unprocessed stone, are not taxed. Lime, cement and stone which is quarried, crushed or which passes through any process, come under the tax.

"Building contractors and sub-contractors, though technically manufacturers are regarded for the purposes of the tax as retailers, selling to consumer. The tax is not chargeable on the amount of the contract, either between the sub-contractor and contractor or between the contractor and the owner.

"If a contractor or sub-contractor manufactures material for his work, such as metal cornices, sash and door frames, iron railing, etc., he is required to pay the tax on the cost of manufacture, including labor. He is not required to pay the tax on installation.

"The tax is primarily one upon materials, and is not intended to be a tax upon labor. Labor used in the installation of materials is not taxed, but the tax does apply to labor used in the manufacture of materials."

Elora, Ont., Plant to be Rebuilt

The large plant of the Ontario Gypsum Company, which was recently destroyed by fire at Elora, Ont., is to be rebuilt at once. In the meantime, the company is in a position to make prompt deliveries from its other plants, so that no occasion for delay will occur in the filling of orders.

P. Q. A. A. Moves to New Quarters

The Province of Quebec Association of Architects, with headquarters in Montreal, have moved from 367 Beaver Hall Hill to new association rooms at 519 Union Avenue, where more suitable quarters have been secured. This will also be the address hereafter of Mr. Alcide Chausse, honorary secretary of the Royal Architectural Institute of Canada, in reference to correspondence dealing with that body.

Architect for Regina Theatre

In the April issue we illustrated the Allen Theatre at Regina without mentioning the name of the architect. This was due to an omission on the part of our western representative who in sending in the photographs at the time failed to give particulars. We have since learned that the architect was Mr. A. J. Rowley of Regina, and therefore take this opportunity of crediting him with the design.

Resumes Architectural Practice

Frank Peden, B.Sc., formerly of the architectural firm of Peden and McLaren, Montreal, and who has for several years past been connected with the engineering staff of the Steel Company of Canada in the capacity of architect, has opened an office at 65 McGill College Avenue. He will resume his practice as architect and constructional engineer.

New Hotel for London Ont.

A report from London, Ont., states that President George M. Reid of the Chamber of Commerce, has announced that plans for a new hotel to be built in that city, are progressing most satisfactorily and that a definite statement will be forthcoming shortly. Location, plans and other matters are now under advisement, and arrangements have practically been completed with contractors and outside capitalists who have undertaken to finance the project after Londoners subscribe the first $200,000.

Trimstone and Building Ornaments

(*Continued from page* 198.)

several years, proving equal to naturally hardened concrete.

No Portland cement concrete product should be subjected to high pressure steam curing until it has its initial set. The steam hardening should start preferably the day following the casting.

Tamped concrete should be kept moist until it goes into the cylinder. As the expense of equipment and operating is considerably higher than curing rooms, only units that lend themselves to completely filling the cylinder space, can be hardened economically, like brick, tile or blocks; at present prices it costs about $20 to harden a volume equal to nine hundred cubic feet or twenty thousand brick. The cost of a cylinder of above size is $6,000 installed. They should be used in pairs to allow the utilizing of steam blow off, from one cylinder to the other, after the curing is finished.

In conclusion I maintain that with honest concrete we can interest the architect, engineer and builder in its general use and while not assuming to instruct them in their choice of material, we can advocate the most extensive adoption of our products if made on the principles of concrete for quality and permanence.

Crushed marble and granite with Portland cement as a binder produces a reconstructed stone of natural components which can be dressed and finished like natural stone without being an *imitation* stone or a misuse of *concrete*. It gives us a staple building material, combining the beauty in color and texture of the natural stones with the strength and economy of concrete.

CONTRACTORS and SUB-CONTRACTORS

HOUSE OF THOS. MIX, TORONTO.

Carpenter, S. Hancock.
Heating, McNaughton & MacKenzie.
Masonry, S. J. Bayley.
Painting, Robert Morse.
Plumbing, McNaughton & MacKenzie.
Tinsmith, W. C. Gurney.

SIDNEY SMITH RESIDENCE, TORONTO.

Masonry, William Edwards.
Painting and Glazing, Robert Morse.
Plumbing, T. B. Smythe.
Heating, T. B. Smythe.

M. SCARTH STEVENSON'S HOUSE, PT. CAVAGNOL, COMO, P.Q.

General Contractor, J. H. Lebeuf.
Electric Fixtures, McDonald & Willson.
Hardware, James Walker Hardware Company.
Tile, G. R. Locker Company.

HOUSE OF MRS. T. G. BROUGH, TORONTO.

Masonry, Russell and Thomas.
Carpentry, Robinson & Wilson.
Plastering, R. C. Dancy.
Painting, Cheshire & Hulme.
Sheet Metal, G. M. Bryan.
Electric Wiring, McDonald & Willson.
Plumbing, John T. Aggett.
Heating, Joseph Harrison.
Hardware, Aikenhead Hardware Co.

HOUSE OF F. C. THOMPSON, TORONTO.

Masonry, W. J. Davidge.
Carpentry, Charles Cooper.
Plastering, E. J. Curry.
Painting, F. G. Roberts & Co.
Sheet Metal, Ball & Baker.
Electric Wiring, Wales Electric Co.
Plumbing, McNaughton & MacKenzie.
Heating, Joseph Harrison.
Tiling, The Italian Mosaic & Marble Co.
Hardware, The Canada Hardware Co.
Wall Board, Ontario Gypsum Co.

HOUSE OF H. A. BOWMAN, TORONTO.

Masonry, W. J. Davidge.
Carpentry, E. E. Woodley.
Plastering, E. J. Curry.
Painting, F. G. Roberts & Co.
Sheet Metal, A. Matthews, Ltd.
Electric Wiring, Wales Electric Co.
Plumbing, Sheppard & Abbott.
Heating, Joseph Harrison.
Hardware, The Canada Hardware Co.
Tiling, The Italian Mosaic & Marble Co.
Wall Board, Ontario Gypsum Co.

CONSTRUCTION

July, 1920

Volume XIII., No. 7

CONTENTS

A SKETCH OF OLD HOUSES OF NEW ENGLAND AND THE MIDDLE STATES (1630-1700) AND EARLY CANADIAN EXAMPLES 203
By Grattan D. Thompson.

THE TOWN PLANNING INSTITUTE OF CANADA........................... 210
By Alfred Buckley, M.A.

A MESSAGE FROM MARS 211

WM. DAVIES CO., LIMITED, DOWNTOWN STORE, TORONTO............ 213

REMODELLED HOUSE OF J. N. GREENSHIELDS, DANVILLE, QUE....... 218

COUNTRY HOUSE OF COL. H. WILLIAMS, M.D., Township of London...... 220

THE USE OF STEEL IN HOUSE CONSTRUCTION 222

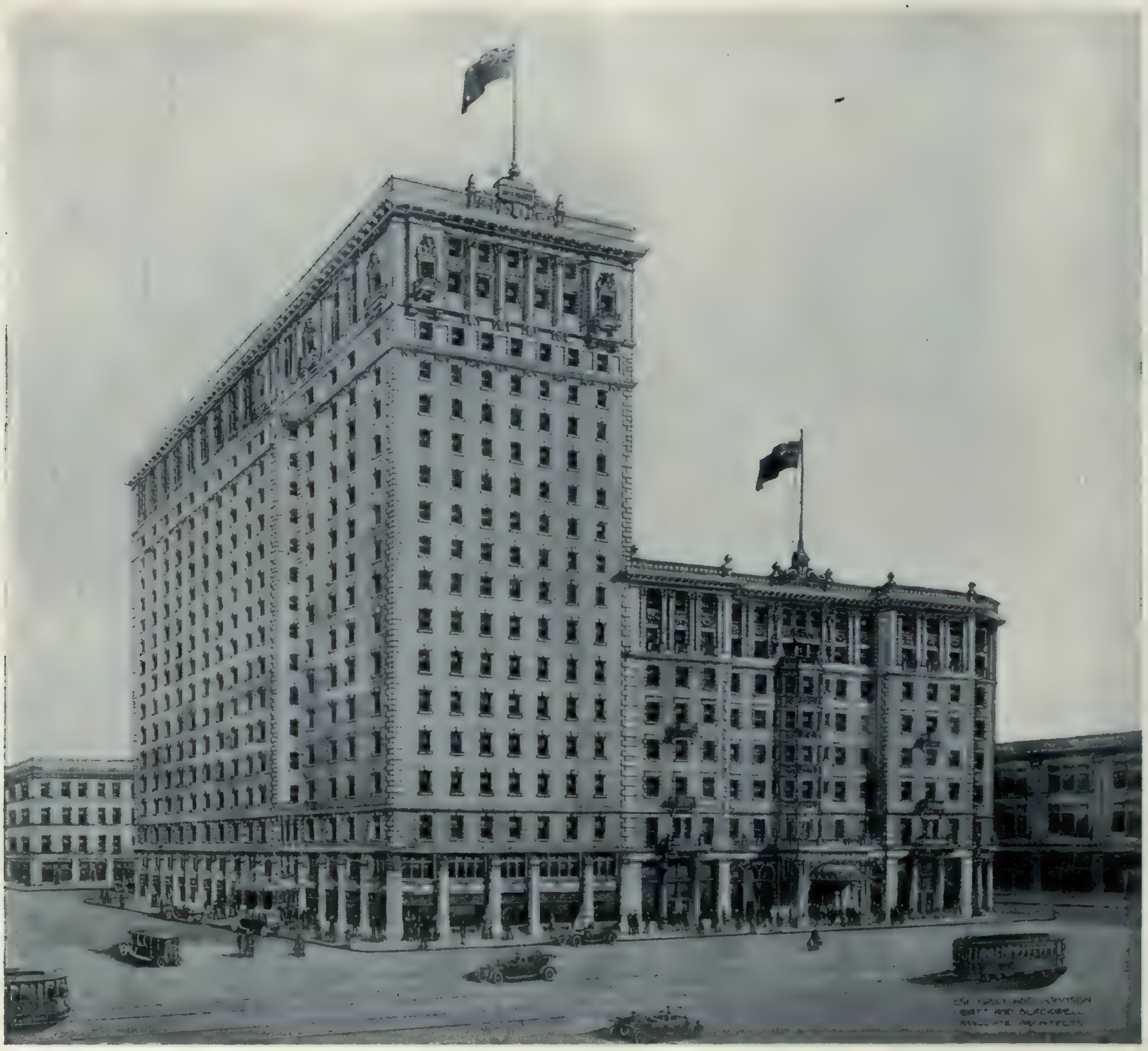
GREEK DESIGN 223
By Jay Hambridge.

EDITORIAL 231
Plans, Taxes and Small Houses.

Full Page Illustrations

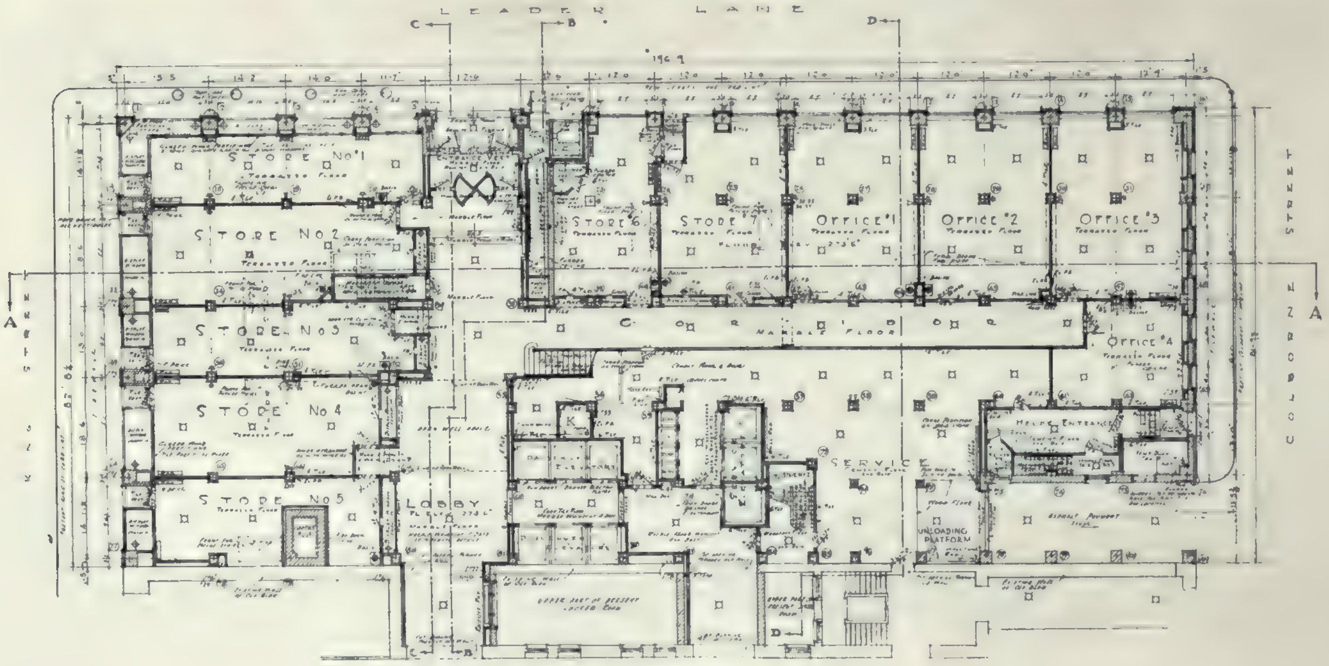
PERSPECTIVE OF NEW ADDITION TO KING EDWARD HOTEL, TORONTO.202

H. GAGNIER, Limited, Publishers
GRAPHIC ARTS BLDG., TORONTO, CANADA
BRANCH OFFICES
MONTREAL NEW YORK



EIGHTEEN STOREY ADDITION TO KING EDWARD HOTEL, TORONTO, NOW IN PROCESS OF ERECTION.

ESENWEIN & JOHNSON, WATT & BLACKWELL, ASSOCIATED ARCHITECTS.



GROUND FLOOR PLAN.

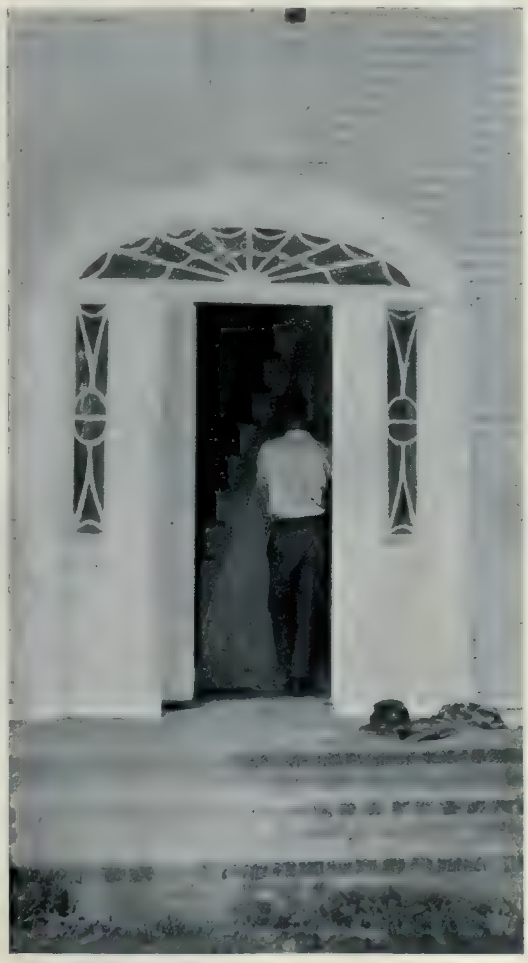
A Sketch of the Old Houses of New England and the Middle States (1630-1700) and Early Canadian Examples

By Grattan D. Thompson.

AT the beginning of the seventeenth century that part of America now known as New England and the Middle States was made up of the colonies of New England, New Netherlands, New Sweden and Maryland. To-day New England includes the states of Maine, New Hampshire, Massachusetts and Connecticut; New Netherlands, the states of New York, Pennsylvania, and New Jersey. Pennsylvania and Maryland both took a part of New Sweden; the rest of Maryland is practically the same as the old state. Changes occurred continually up to the War of Independence, when the states were very much the same as they are now except that their western boundaries were not defined.

The period 1630-1770 includes all the work known as "colonial" and the early part of the "Georgian Style." The later "Georgian" work was merely a repetition on a smaller scale of the English Georgian. But these terms are confusing. Why use two names to describe one period? What is meant by the term "Colonial"?

Fletcher says: "During the eighteenth century buildings were erected which have been termed 'colonial' in style corresponding to what is known in England as Queen Anne or Georgian." He is fairly right as far as he goes, but that is not far enough. Another writer said: "The best buildings were erected after 1760." But what about the work of the seventeenth century? Surely those charming little cottages built in the seventeenth century are even more worthy of a name than the later examples which are so tinged with copyism. Strictly speaking, "colonial" means anything pertaining to a colony. The United States was a colony between the landing of the Pilgrim Fathers in 1620 and the War of Independence in 1770. Therefore the style developed between those dates is Colonial. The adoption of this interpretation allows us to include the early phase of Georgian influence on Colonial architecture and excludes the later buildings which were pure Georgian. Of course the student must understand that architectural periods cannot be cut and dried to coincide with any set date. Colonial architecture continued after the war till other styles gradually superseded it.



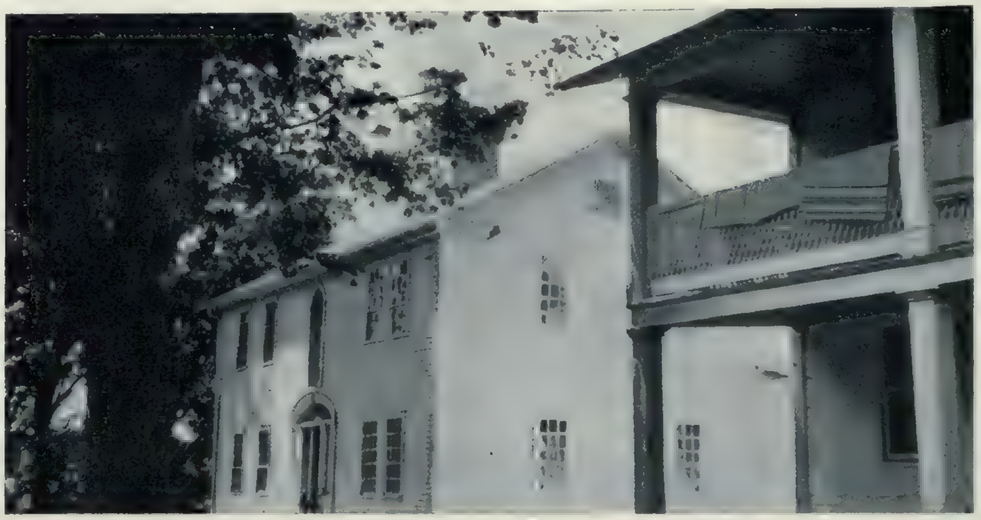
DOORWAY: OLD COLONIAL HOUSE, GEORGEVILLE, QUEBEC.

"Colonial" includes the architecture of all the colonies under one heading. But there are natural subdivisions owing to the different nationalities of the settlers. The two main divisions are the so-called "Dutch type" and the New England type. Others such as the plantation houses of Maryland and Virginia are merely variations of the two already mentioned.

NEW ENGLAND.

Though this colony was settled later than New Netherlands, the traditional dwelling seems to have been developed earlier than the Dutch type. The Capen House, Topfield, Mass., was built in 1683. There seems to be no Dutch example earlier than the eighteenth century. The Capen House has been completely restored, but it gives us a general idea of how these early English settlers built.

The traditional plan is rectangular, and in the early buildings is only one room deep. The distinguishing feature is the grouping of the fireplaces around one chimney stack. This was evidently a fire precaution, as the house was constructed of timber. The large stack is in the

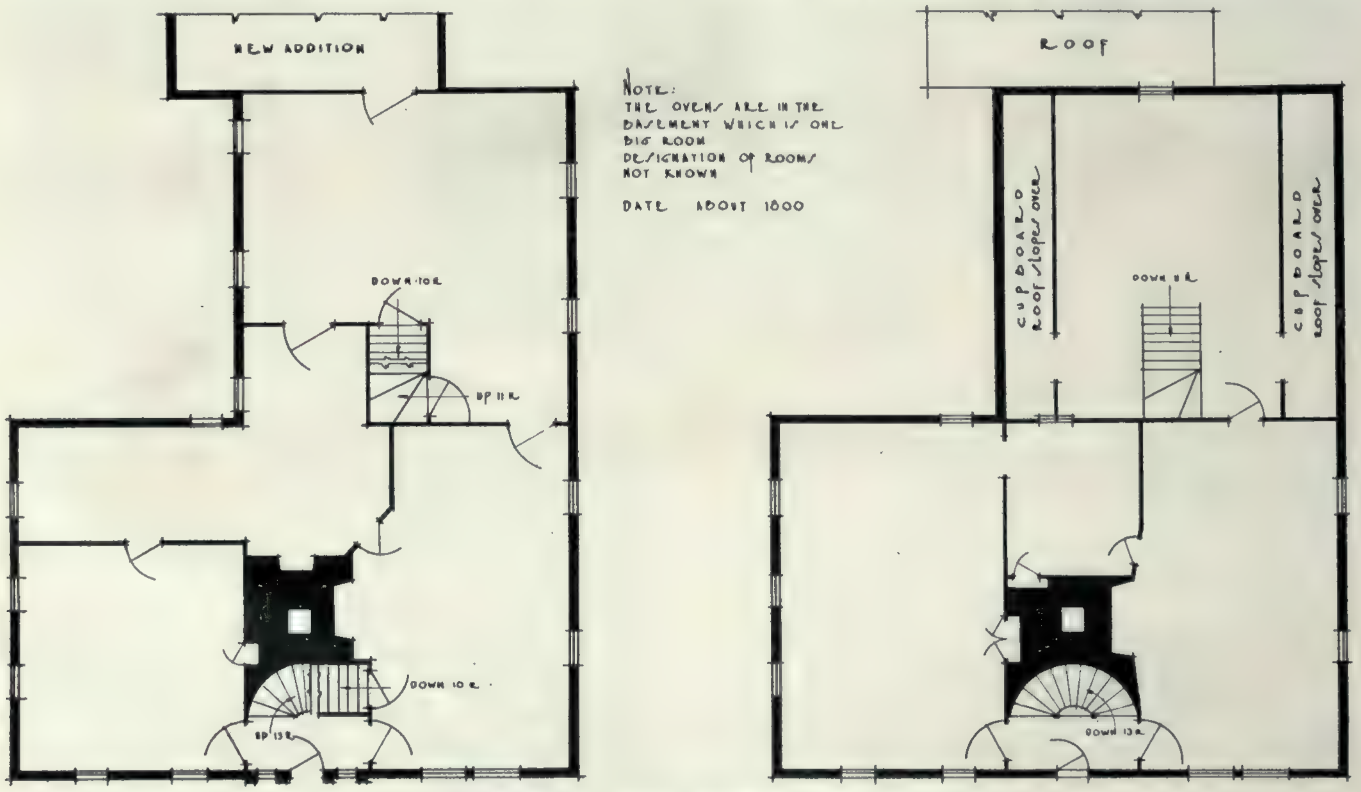


OLD COLONIAL HOUSE, GEORGEVILLE, QUEBEC.

centre of the rear wall; immediately in front of it is the entrance hall off which the two rooms open. Into this tiny hall are packed the stairs which often had a rise of eight or nine inches. These lead to the two other rooms which were similarly placed to those downstairs. Later on more rooms were needed and an addition was put on the back to serve as kitchen and pantry.

When we come to examine the construction we see the unmistakable influence of English building traditions. The framework was of wooden studs with an infilling of brick or clay, the typical English half-timber method. Over this was nailed a covering of clapboards. The framework rested on a foundation of field stones laid without mortar. If there were no cellar only piers were sunk, and the floor was made of clay mixed with straw and packed between the joists. The floors were framed on four or six girts with intermediate girts called summer beams. Into this were mortised the floor joists.

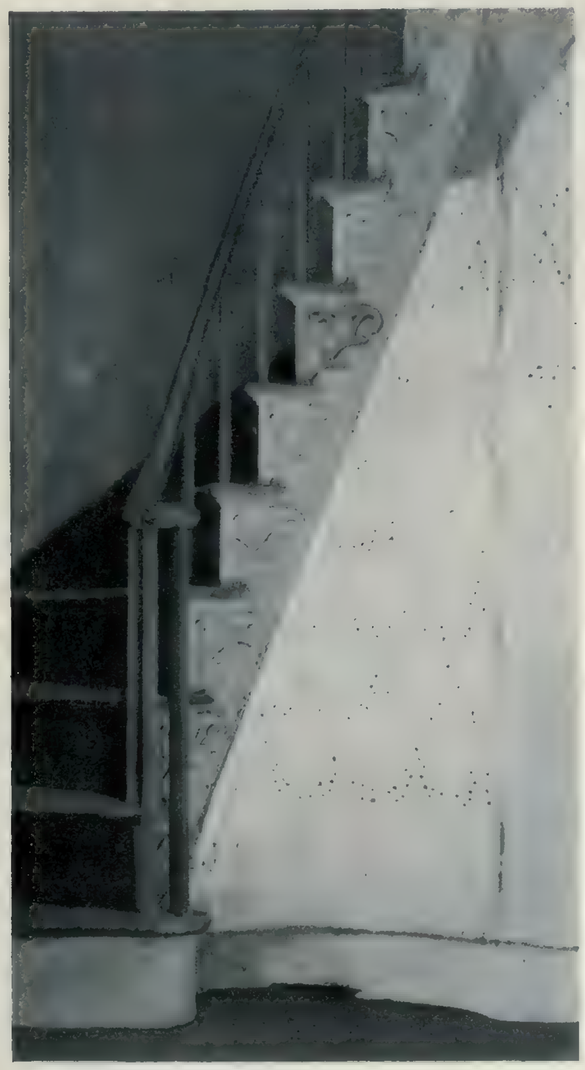
Pitched roofs were used exclusively till the beginning of the eighteenth century, when the gambrel form appeared. The rear slope was carried right over the addition at the back and gave the characteristic long sweep of roof. Another feature of these houses is the overhang of the first storey. It has been suggested that this is reminiscent of the fortified blockhouses. At first the idea might seem ridiculous, and rightly so if the overhang were only done by the usual method of framing. But there was another kind known as the "hewn" overhang. The solid posts of the ground floor were hewn back a few


NEW ADDITION
NOTE:
THE OVENS ARE IN THE BASEMENT WHICH IS ONE BIG ROOM
DESIGNATION OF ROOMS NOT KNOWN
DATE ABOUT 1800
DOWN 10 R.
UP 11 R.
DOWN 10 R.
UP 13 R.
ROOF
CUPBOARD ROOF SLOPES OVER
DOWN 8 R.
CUPBOARD ROOF SLOPES OVER
DOWN 13 R.

OLD COLONIAL HOUSE, GEORGEVILLE, QUEBEC.
Showing how the Early Work spread just over the Border.

inches to allow the floor above to project. When a builder did that he must have been trying to copy something he had heard of or seen.

The openings were always regularly spaced, a central one with two on each side. The windows were casement with lozenge shaped leaded glazing. The slender proportions of the shutters which were always fitted to the windows added greatly to the dignity and charm of the house. In early examples the doorways were quite simple; later on they became more elaborate and were treated with classic motives though always retaining that delicacy of detail which was so characteristic of colonial work.



OLD COLONIAL HOUSE, GEORGEVILLE, QUEBEC.
Typical Colonial stairs (New England type) tucked up against the central chimney.

The best examples of this type besides the one already mentioned are:

The Boardman House, Sagus, Mass. 1650.

The Ward House, Salem, Mass. 1654 (restored). This is one of the few examples with gabled roof.

The Adams House, Quincey, Mass. 1681.

The Hancock-Clarke House, Lexington, Mass. 1681. The front was renewed in 1734 and is more classic than the rest of the work.

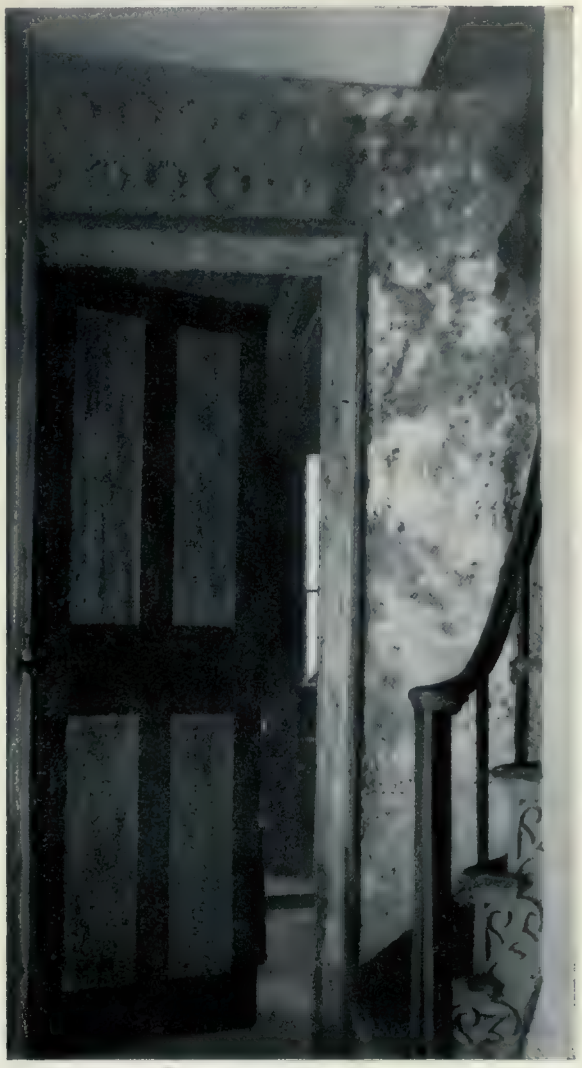
The Holabud House, Falls Village, Conn. 1735. The pitched roof chimney has been removed and a flat roof substituted.

The Old House, Farmington, Conn. About 1700.

The Old Colonial House, Georgeville, Canada, About 1800.

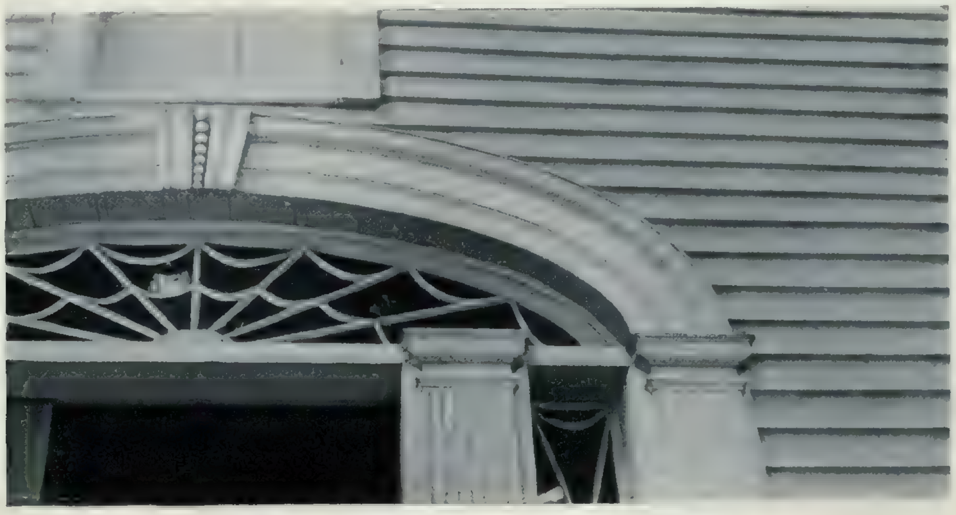
BRICK HOUSES.

Owing to the great quantity of timber available, wooden houses were the general rule, but there are some early brick houses. They were far more costly because the bricks were generally brought from England and Holland. These houses show the general characteristics of the early traditional type: the great difference is due to material. The chimneys were placed on the end gables instead of being grouped in the centre. The roofs are gambrel and of fairly steep slope. Dormers were introduced in the later examples and the openings were spaced in the usual symmetrical manner.



OLD COLONIAL HOUSE, GEORGEVILLE, QUEBEC.
Detail of interior door. The mouldings are all very simple and delicate.

The earliest is the Cradock House, built about 1634, though some doubt is cast on this early date. The cornice projects slightly, and there is a string course at the first floor level. Small loopholes were put on each floor for defence. The dormers and porch were a later addition.



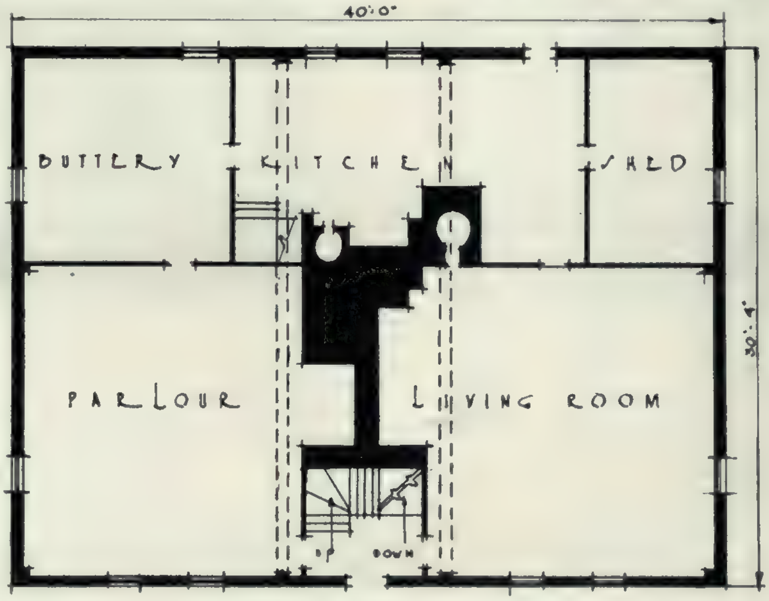
DOORHEAD: OLD COLONIAL HOUSE, GEORGEVILLE, QUEBEC.

Another early house is the Hagen Garrison at Haverhill, Mass., built about 1680 or 1690. It is much the same as the Cradock House. The small windows at each end of the front elevation were probably loopholes at one time.

The other examples are later and show the beginning of Georgian influence. The Ruthard Derley House, Salem, Mass., 1761, and the Heldreth House, Concord, Mass., indicate the development of the style. Doorways are richer and the cornice more elaborate.

QUEBEC AND ONTARIO.

Before going on to the later development of Colonial work, brief mention must be made of the effect of this architecture on the early buildings of Canada. As was only natural, the New England type spread over border, and at Georgeville on Lake Memphremagog, close to the State of Vermont, is a perfect example of an early New England house. The plan shows all the characteristics of the type, and the detail throughout is very delicate. The house has been bought by an American, and is being restored by the old village carpenter, to whom it is almost sacred. In it are some old chairs, which are the same date as the house, about 1820.



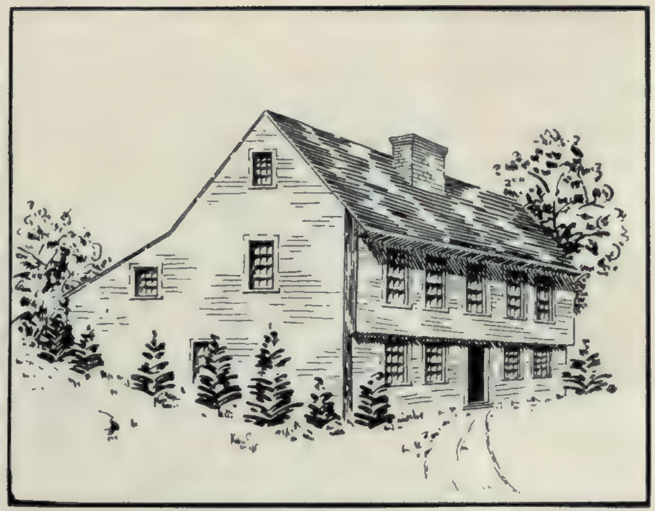
BOARDMAN HOUSE, SAGUS, MASS.
The earliest type of New England house, showing the method of grouping fireplaces.

As soon as we leave the border, traces of the New England influence disappear, and we find the French-Canadian stone house. This, in my opinion, shows a strong resemblance to the Dutch Colonial house. The material, the placing of the chimneys on the end walls, the hipped roof with the long, sweeping curve and large projection at the eaves, which, in most cases, continues over the gallery, are all reminiscent of many an old dwelling in New Jersey. Montreal and the surrounding country is rich in examples of these old French houses.

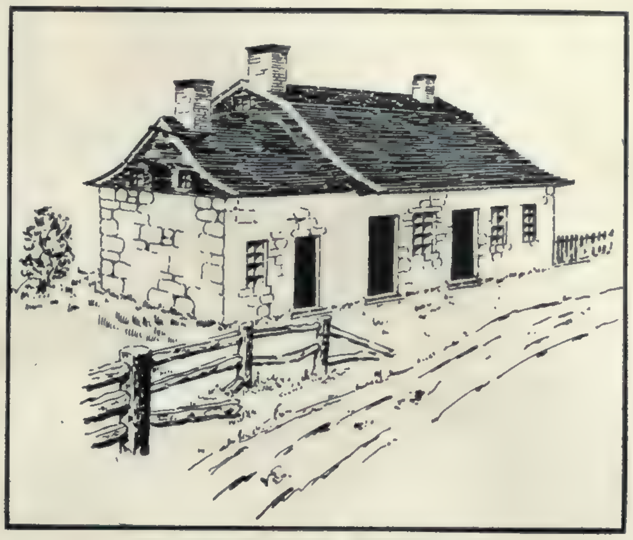
In the district around Grimsby, Ontario, there are other interesting examples of Colonial influence. Here and elsewhere in Eastern Canada these houses would well repay a little study.

THE MIDDLE STATES.

As the old name New Netherlands implies, this part of the country was settled by the Dutch. Its architecture has been called Dutch Colonial, but the term is misleading. Lower New York and New Jersey, where we find some of the best examples, ceased to be a Dutch colony in 1664, and its earliest dwellings, which were probably log cabins, have disappeared. Nor does the style display any markedly Dutch characteristics. But the traditional houses are quite distinct from those in New England. So strong did the local tradition become that it continued unmodified to the end of the eighteenth century. The Dutch settlers were little influenced by their English neighbors: where the English settlement ended the type of house immediately changed. This state of affairs lasted till the War of Independ-



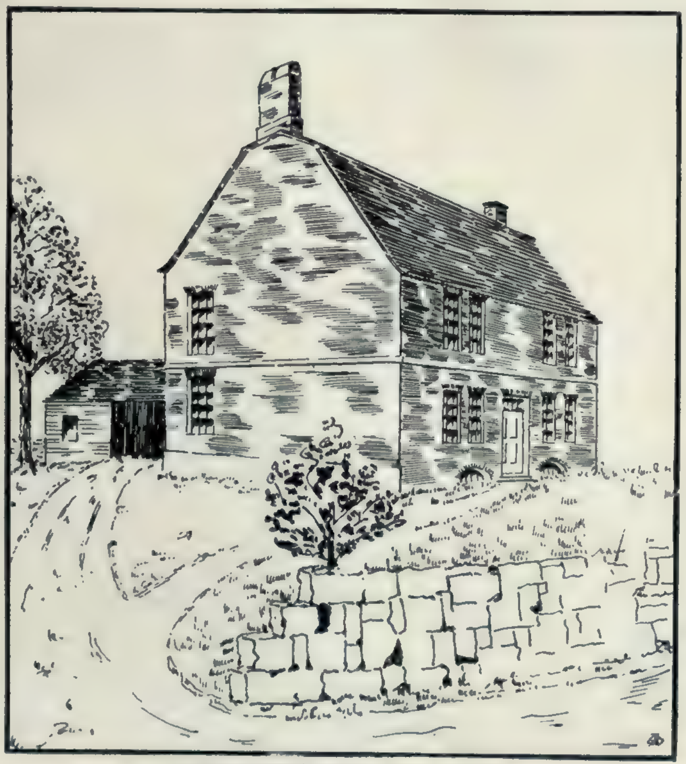
THE OLD HOUSE, PIGEON COVE, MASS.
A good example of New England house with the typical overhang of the second storey.



THE CRADOCK HOUSE, MEDFORD, MASS.
A quaint Dutch Colonial Example.

ence. The war broke the barriers, and English influence gradually asserted itself.

At first glance the plan of these appears quite distinct from that of New England, but on close examination we find that the main idea is the same. The change is due to the difference in material. Stone was the chief material employed, though there are examples in wood and also in roughcast. The use of stone may be due to the cheapness of labor, as the slave trade thrived in this district. Stone was just as plentiful in New England as here, though it was never used to the same extent. With stone, fire precautions were not so necessary; the chimneys were separated and placed on the end walls. (The chimneys in the farmhouses of the Province of Quebec are placed in the same position). The entrance is in the centre, but the hall, barred by no chimney stack, runs clear through to the back. On each side are two rooms, the larger in front, the smaller behind. The stairs in the early examples are unimportant for the attic was unfurnished and used only for storage. These houses were only one storey high, but covered more ground than those in New England. There was generally a wing at each end of the house, one containing the dining room and kitchen, the other used by the servants. Both were kept low and were roofed in the same manner as the main part.



THE DEMAREST HOUSE, NEW JERSEY.
An early brick house.

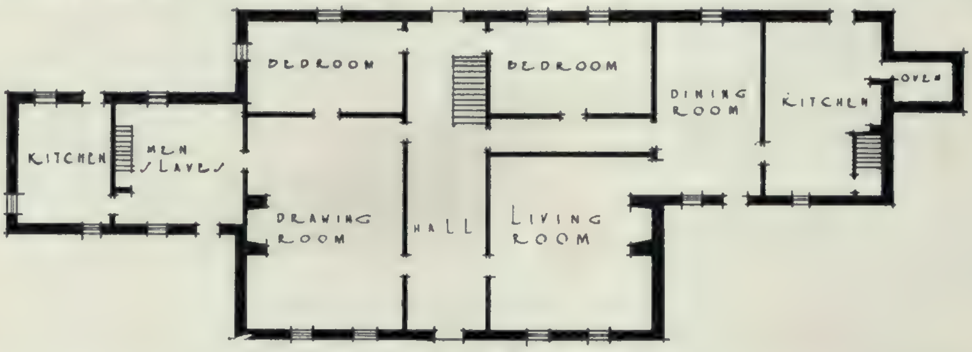
The roof was usually gambrel with long, sweeping curves and a large projection at the eaves. Plain hipped roofs were occasionally used. The great projection is one of the distinguishing characteristics of the type. It may have been due to the necessity of protecting the walls. The builders used ordinary clay from the fields, which served the purpose well enough but was washed out to a certain extent by the rain. Later on the overhang increased so much that posts were introduced to support it, and we commonly find galleries both at the front and the back. These roof eaves were often formed into a box cornice very delicately moulded. The cornice, window architraves and doorway are the only moulded features of the exterior.

In the early houses the attic was lighted by windows, usually three, in the end walls. When the attic became an extra storey dormers were introduced. In later examples they are a regular part of the design. As in New England, the spacing of the openings is regular, but the doorways never became as elaborate as those of the English. They were divided doors with heavy knockers.

The interiors were very simple. The broad, low rooms with the great oak beams showing, and the low broad fireplace gave a pleasing air of homeliness. Some of the best examples of the type are:

The Original Demarest House, New Jersey. 1700.

The Vanderbeck House, Hackensack, N.J. 1717.



THE HOPPER HOUSE, HACKENSACK, N. J.
Showing strong Georgian influence on later Colonial work. Note the end pilasters and the "Captain's Walk."

The Ackerman (Brinckerhoff) House. 1704.

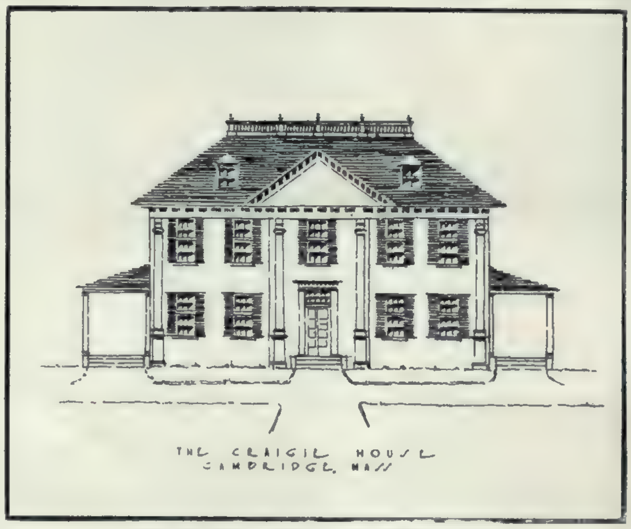
The Terhune House, Hackensack, N.J. 1759.

The Old Homestead, Brooklyn, N.J. 1750.

THE EARLY GEORGIAN INFLUENCE.

During the first half of the eighteenth century communication between the Old Country and the new steadily increased. The Colonial settlers became wealthier and conditions of living generally improved. With this increased wealth came the natural desire to have larger and more imposing dwellings. The poor, of course, had to remain content with the simple houses, but something more imposing was demanded by the rich.

English Georgian was the field whence came the material for this new display. Its influence spread throughout the country irrespective of state borders. Traditional types seldom showed through the heavy coating of the new style, and the larger houses became, to all intents and purposes, reproductions of the English examples. At first we see evidences of the new influence in the increased amount of detail. The detail was classic freely applied. Cornices became heavier and richer, and later on were usually pedimented in the centre. Below this pediment was a typical Palladian window treatment. Doorways were greatly enriched by the use of columns, pilasters, etc. The shell-hood form of doorhead was very often used. It is evidently a genuine Colonial form as nothing of the kind is found in English work. Columned porches and verandahs were very common in the later examples. A favorite treatment was the use of long, slender pilaster strips extending from the ground to the cornice, one at each side of the door and one at each angle. The angle pilaster was generally found in wooden houses, and was possibly a convenient way of stopping the clapboarding.



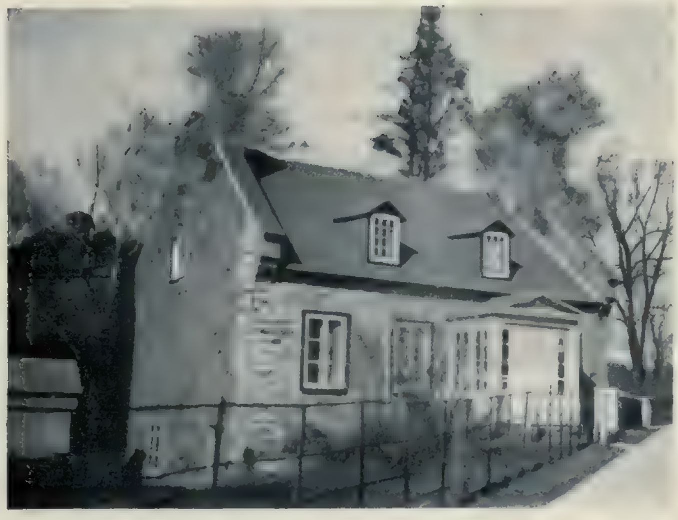
THE CRAIGIE HOUSE, CAMBRIDGE, MASS.
A later example showing Georgian influence in the regularity of the plan.

The interiors were even more extensively treated. Panelling was largely used and mantelpieces were richly moulded and carved. But throughout there is a peculiar refinement which only occurs in Colonial work.

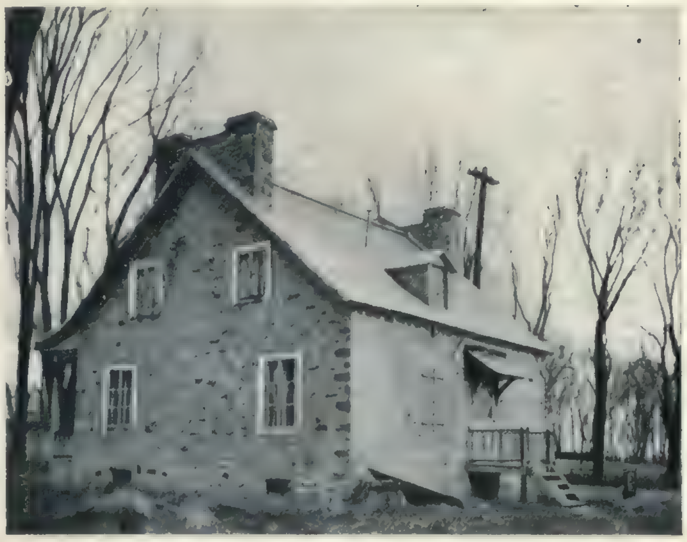
The plans remained rectangular with the stair hall in the centre. On one side was usually the large reception room and on the other were two smaller rooms, probably the dining and living rooms. With the increased number of rooms there came a corresponding poorness of service, a truly Georgian characteristic. The rooms are higher, but there are seldom more than two storeys and an attic. The secondary buildings were usually disconnected, though sometimes in New York and New Jersey we see evidences of tradition in the use of one or more wings.

Roofs were hipped or partially so, the space on top being flat with a balustrade round it. This was a common feature and was known as the "Captains Walk." Probably the old sea captains wanted some deck to pace. Dormers were gabled and chimneys were equally spaced at or near the eaves. The openings are still regular, though often more than the traditional five. Symmetry was an essential and, as in English Georgian work, everything was sacrificed to it.

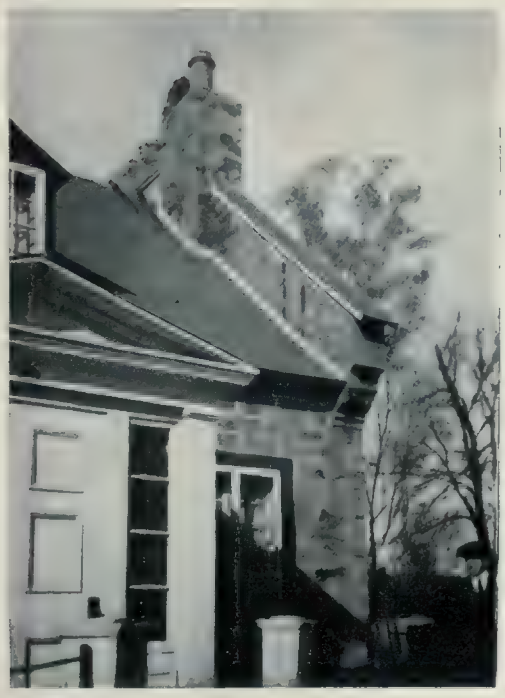
Colonial architecture takes on a new interest by the study of these early buildings. There is great charm in their simplicity and quiet dignity and much inspration in their straightforward construction. To be fully appreciated they must be seen in their surroundings, the beautiful rolling country of New England, and the Middel States.



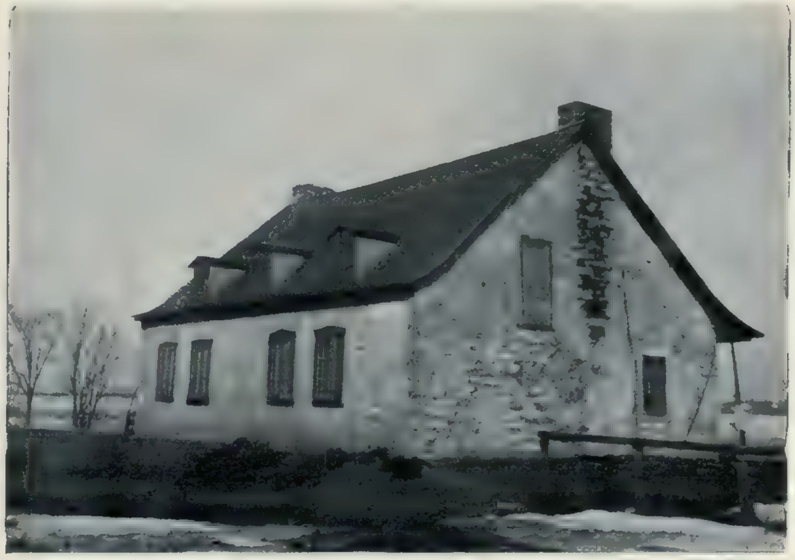
OLD HOUSE, COTE DES NEIGES ROAD, MONTREAL.



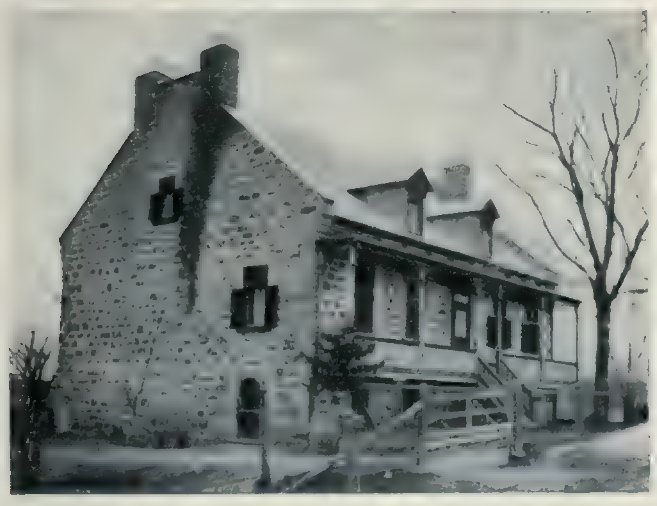
OLD HOUSE, AHUNTSIC, QUEBEC.



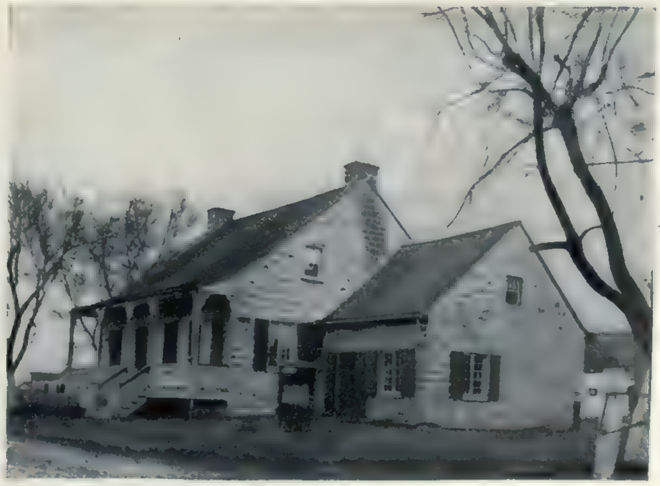
DETAIL, COTE DES NEIGES ROAD, MONTREAL.



OLD HOUSE, NEAR ST. VINCENT DE PAUL, ILE JESU, QUEBEC.



OLD HOUSE, NEAR ST. EUSTACHE, QUEBEC. (ABOUT 1820.)



OLD HOUSE, ST. EUSTACHE, QUEBEC. (ABOUT 1830.)

The Town Planning Institute of Canada

By Alfred Buckley, M.A.

THE Town Planning Institute of Canada was formed a little more than a year ago with the object of advancing the scientific study and practice of town planning in Canada. It was felt by the promoters that there was need of an organization that would bring architects, engineers, surveyors and landscape architects into definite professional relation with town planning with a view to qualification for the increased demand for town planning work. In England and the United States scientific town planning has become a definite profession and the Town Planning Institute of Great Britain has been the means of guaranteeing qualification when the demand has come from towns, cities and rural districts for the preparation of plans for future development. Engineers, architects and surveyors have shown themselves alive to the professional importance of the town planning movement and have been perfectly willing to submit themselves to the necessary studies and examinations that have been imposed by the Institute.

It is recognized that the most authoritative qualification might best come from the universities and it is part of the object of the Canadian Town Planning Institute to promote educational courses in the Canadian universities and make town planning a branch of applied science with the imprimatur of the university.

The Toronto University has taken the first step in this direction and has already held a series of lectures on town planning. General Mitchell, Dean of Applied Science, informed the members of the Institute at the second annual meeting held in Ottawa on July 5th, that he hoped more progress would be made in this direction in the immediate future. The Professors of Architecture in McGill University have also considered the question and are strongly in favor of the movement if the necessary funds become available. There is clearly a great opportunity here for wealthy and benevolent citizens to endow town planning chairs in the universities of Canada.

Meanwhile the Town Planning Institute, now composing 114 members, has set itself to do the preliminary work of qualification. More and more demands are being made from towns and cities for the services of professional town planners and already the demand exceeds the supply. Canadian patriotism likes to think that when important Canadian work has to be done its own sons should have an opportunity to do it. The Federal plan for the districts of Ottawa and Hull cost $80,000 and the work was given to an American town planner. There are some suggestions from professional men that no private body of men can set themselves up as examiners of their fellows, but it requires little thought to see that this is not reasonable. Education would have progressed very slowly if colleges had not been founded by private persons whose object was to supply men of experience and study as examiners of their fellows. Clearly until the universities decide to make town planning a specific branch of instruction in applied science, an organization such as the Town Planning Institute of Canada may do valuable work in promoting qualification for town planning practice.

The first year of the Institute has been largely occupied with organization and enrollment of members. At the Second Annual Meeting a constitution was presented and occupied most of the time of the conference.

The objects of the Institute are declared to be:—

(a) To advance the study of town planning, civic design, and kindred subjects, and of the arts and sciences applying to these subjects.

(b) To promote the scientific and artistic development of land in urban and rural districts.

(c) To secure the association of those interested in the study of town planning and to promote their interests.

The attention of engineers, architects, surveyors and landscape architects may well be called to the last five words under (c). It cannot be said that the promoters of the Institute desire anything for themselves that they do not desire for their colleagues. The time seems to have come for the differentiation of propaganda from practice or for the recognition of the fact that practice is the best kind of propaganda. Canada needs town planning but she also needs town planners. There have been many volumes written about the need of town planning and the economic and human disasters that have followed the lack of planning. It has been pointed out over and over again that the high taxation of cities is mostly due to the lack of planning for different uses, to the need of the zoning of cities. It was stated at a recent Chicago conference on zoning that practically all the large towns of America "now feel that it is almost impossible to continue further without the adoption of a building zone plan." It has been shown that many cities have spent millions of dollars of the people's money in repairing their own mistakes, due to the lack of foresight in planning. The time seems to have come for the definite organization of a body of men who shall be qualified to "take the job" when the call comes. This is the object of the Town Planning Institute of Canada.

The officials elected for the ensuing session were:

President, Thomas Adams, Ottawa; vice-presidents, Dr. E. Deville, R. H. Millson, and Noulan Cauchon, of Ottawa; council, J. B. Challies, Ottawa; H. B. Dunington-Grubb, Toronto; J. P. Hynes, Toronto; Dr. Otto Klotz, Ottawa; James Ewing, Montreal; T. McQuesten, Hamilton; Dr. E. Nadeau, G. Todd, Montreal, and Prof. Nobbs, Montreal; librarian, W. D. Cromarty, Ottawa; secretary-treasurer, F. D. Henderson.

Four committees with chairmen were also appointed as follows:

Public Education on Town Planning, Chairman, Brig.-General Mitchell, Dean of the Faculty of Applied Science, Toronto.

Legislation Committee, Chairman, J. P. Hynes, Toronto.

Publicity and Literature Committee, Chairman, A. Buckley, Ottawa.

Ways and Means Committee, Chairman, Jas. Ewing, Montreal.

The Publicity and Literature Committee expect to issue a bulletin on the progress of town planning in Canada for the information of the members and the press.

Information and forms of application may be had from the Secretary, F. D. Henderson, Topographical Surveys Branch, Ottawa.

A Message from Mars

The Martians are much disappointed with our town planning, according to a statement made by Dr. Otto Klotz, Director of the Dominion Observatory, at the Second Annual Meeting of the Town Planning Institute of Canada held in Ottawa on July 5th.

Following is the text of Dr. Klotz's communication:

"Last Thursday night after the static of the atmosphere had quieted down following the wireless to Mars about the sessional indemnity, I got in communication through the astronomer royal of Mars with its chief town planner, and he gave me a summary of what he had seen at their observatory after viewing the earth, particularly Canada and the United States.

"You all know that the inhabitants of Mars, from the fact that Mars is much smaller than the earth,, are giants compared with us. You see there is less pull on Mars than on the earth —their civil service commission was instituted long, long ago. On account of the decreased weight of things the Martians will do more work in one day than any union here would allow to be done in three. For their government telescope, our telescope would only serve as an eye-piece; so you can readily understand that they know more about the earth than we do about Mars.

"These Martians are of great intellect, where we weigh our gray matter by ounces, they measure theirs by the bushel. But to get to the summary sent, I may say that we tuned our wireless to 20,000 metre wave-length, and with our amplifier got good notes.

"The brief report began by saying that he did not understand why we were possessed to lay out all our towns and cities in rectangular blocks; of course he had not heard that Euclid had invented that banal figure of a parallelogram to which we were glued. He wondered if that was a community plan or only of a single individual who was allowed, without let or hindrance, to inflict such a plan, having roads straight up hill and down hill, quite oblivious of the topography and configuration of the ground, and lacking main thoroughfares and arteries. I didn't get a chance to talk back to him, to explain how in this free country we have hitherto acted.

"Next he spoke of the dark canyons in some of the larger cities, where sky scrapers border the streets, excluding light and air from the inhabitants.

"He noticed too vast volumes of smoke emanating from different parts of the cities from various industries drifting across the city. This seemed strange to him. If smoke there must be why not confine it to one part of the city so that the prevailing winds carry it away from the city for the comfort of the inhabitants. 'We on Mars as you know,' he continued, 'have no smoke at all, our power and heat we derive from electricity directly from the sun, and also from the latent energy stored in atoms.'

"He noted too the promiscuity of our buildings—residential, commercial, industrial, tenement, suburban—planless, senseless, often vicious.

"Like ants he saw the inhabitants moving about; swarms where there were least habitations with fresh air and sunlight and open patches. Again he wondered whether we had no gray matter and consideration for the welfare of the masses. 'We do things differently on Mars,' he said. 'Every Martian is entitled to so many cubic feet of fresh air and sunlight, and every child to so many square feet of playground.'

"He admired our woods and rivers and mountains and plains, and said that nature had been more kind to the earth than to Mars, but that the inhabitants of the earth had evidently not properly made use of these gifts, and utterly failed in wisely planning for community living.

" 'With us,' he continued, 'community living is planned and each community and place has its individual plan, adapted to the inhabitants and to the ground and surroundings and for the welfare of all.

"'You, who have so much on the earth and so diversified a surface, that you have all the material and circumstances for making beautiful, healthful cities where the work and inspiration of man can combine with nature's gifts to serve well the people in every walk of life, have great opportunities for benefiting the public and for leaving a rich heritage to posterity.'

"His telephone rang and he was off, leaving me pondering on this message from Mars."

Standardization in Building Construction

Greater production, the need of the hour, says a contemporary, is greatly influenced by labor and market conditions. These, to a large extent, are beyond the control of those directly responsible for management, but the important factor of standardization is largely in their hands. Particularly under unstable labor and market conditions will the beneficial influence of standardization be evident and under normal conditions its value in contributing to maximum production will be most apparent. In other words, standardization means greater production results under all prevailing labor and market conditions.

Standardization has already accomplished wonders in the manufacturing field, whether applied to the smallest and simplest manufactured article or to the most complicated mechanism. It is because of standardization that many American-made machines or products have been able to compete successfully in all parts of the world with goods manufactured locally.

Standardization in the construction industry, however, has lagged. It has not responded as it should have to the evident trend in other fields. It should be obvious that the construction industry loses much by the haphazard variety of design and construction still prevalent. Standardization would decrease cost and time of construction and would save cost and time in planning. It would tend also toward a more uniformly satisfactory, finished structure.

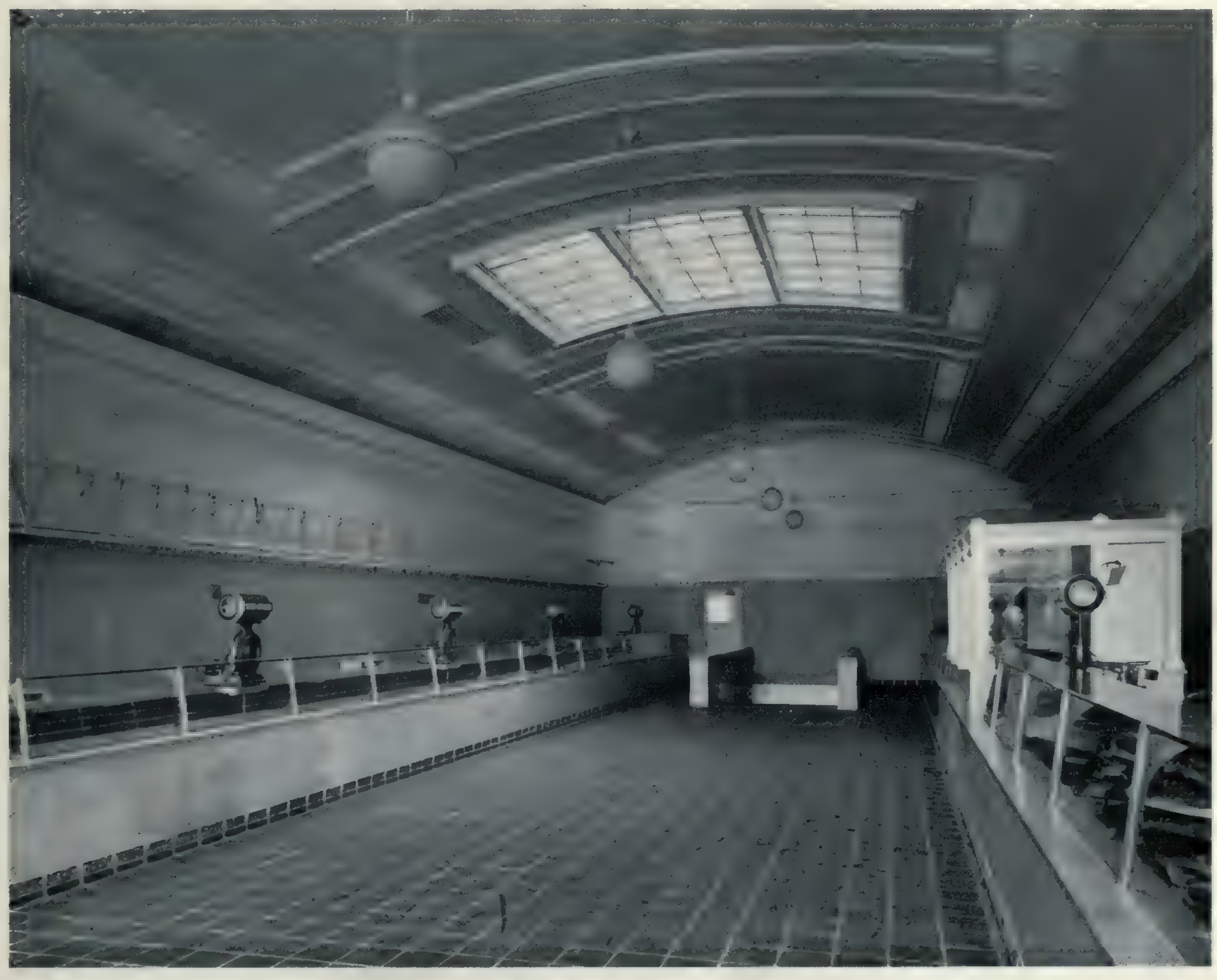
Opponents of standardization fear that through it architectural beauty and individuality may be sacrificed. This fear is unfounded, because no standardization should be carried to such an extreme that it produces monotony. In building construction, standardization should be confined to those operations and details which, while securing maximum utility, will enable the builder to produce a structure that will harmonize with its surroundings. Not only need architectural beauty not be sacrificed, but many offensively overdone attempts at adornment would be conspicuous by their absence. Sane standardization would reflect the spirit and quality of our life and activity without permitting conglomeration of plain walled buildings, jumbled up with every imaginable variety of facades which are within the range of vision at any spot on any one of the principal business streets of every large city. A standardization which would standardize good architecture should be welcome.

As a natural result of standardization in various manufacturing processes, a certain degree of it has been forced on the construction industry. Rolled shapes, commercial timber sizes, plumbing fixtures and millwork for example, are available to the designer in a variety of standard dimensions and he departs from these only when he is prepared to pay the penalty of the high cost of "specials."

Of all types of construction, concrete is least affected by available sizes. The designer is allowed the utmost latitude, but this should be taken advantage of only when necessary to satisfy some particular requirement. Minute variation in sizes of floor beams, columns or girders is inexcusable in concrete construction because the cost of forms represents a large portion of its total cost and increases rapidly with refinement in sizes. It should be borne in mind that beams larger than necessary reduce the amount of reinforcing required and that a design calling for larger members in order to secure uniformity in size has the double advantage of saving steel and simplifying form work. The figuring of every column, beam and girder to the smallest fraction of an inch, and producing a variety of dimensions differing but slightly one from another, result inevitably in an unnecessarily costly building.

Heating Rooms by Power

In a lecture recently delivered before the Institution of Civil Engineers in London, England, Sir Dugald Clerk revived an interesting proposal made by the late Lord Kelvin for the heating of rooms. This proposal is not easy to explain without diving into mathematics and the abstruse laws of heat, but it may be expressed as a process of using an engine to extract some of the heat from cold air outside a room and adding it to the heat of the air inside the room. The curious and puzzling thing about this process is that the heat so added is under certain conditions, much greater than the heat equivalent of the work done by the engine. In theory, therefore, an electric motor may be used very efficiently to warm a room. Whether the notion will work out satisfactorily in practice remains to be seen, but in view of the ever-increasing cost of fuel this fascinating problem is likely to be soon attacked by British engineers.



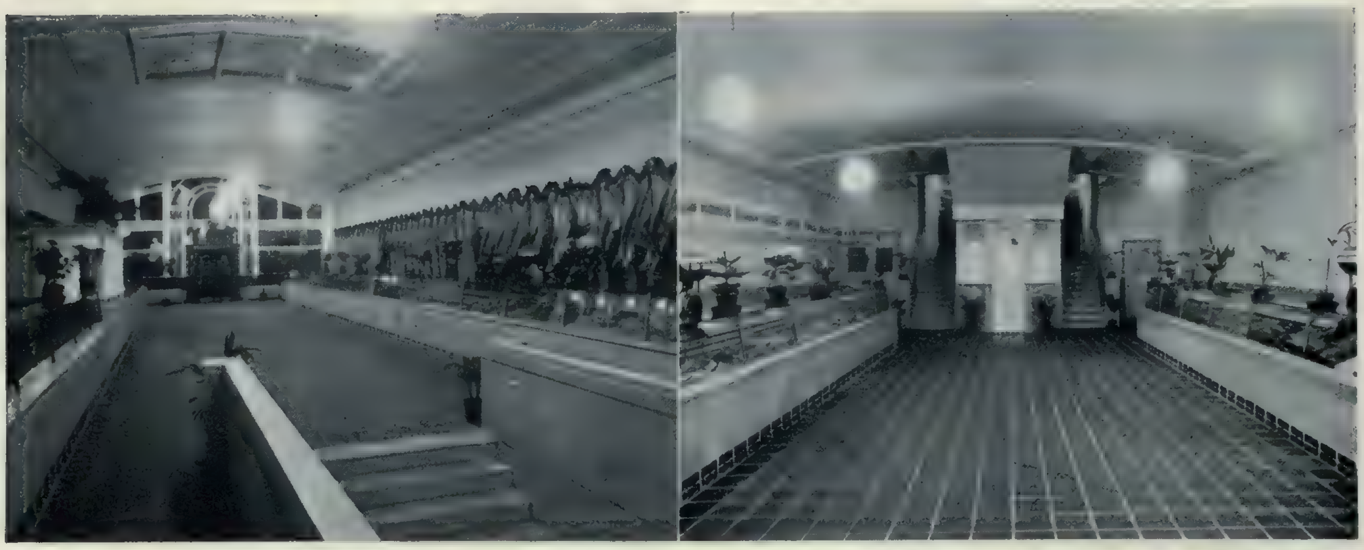
DOWNTOWN RETAIL MEAT AND PROVISION STORE OF WM. DAVIES CO., LIMITED, QUEEN STREET, TORONTO.
HYNES, FELDMAN & WATSON, ARCHITECTS.

Wm. Davies Co. Store, Toronto

Retail meat and provision stores have been so long rooted in the traditions of sawdust floors and commonplace fixtures that it has seemed a slow process in bringing them under proper architectural influence. At last, however, this is being accomplished. In the new downtown premises of the Wm. Davies Co., Limited, at 29 Queen street west, Toronto, of which protógraphic illustrations are presented herewith, one at least observes an establishment of this kind which is designed along entirely new and attractive lines. The architects have not only shown a thorough grasp of the owners' requirements, but in working out their problem have produced a most striking integral development. In the matter of arrangement and equipment the scheme has been so considered to arrive at a result which gives the utmost in the way of a systematic plan and at the same time to provide every facility and convenience to comfortably assist customers in doing their shopping.

Entrance to the store is through a revolving door into a spacious and decidedly inviting interior. The ground floor is devoted to the display of fresh meats and provisions, and the basement section, which is approached by marble staircase, is arranged for the display of smoked fish and general groceries. Grey Tennessee marble enters largely into the scheme on both floors, this material being used throughout for the walls and counters. The floors are of red tile with the tile work brought up on either side to form the base of the counters. The attractiveness of the scheme in itself is purely the outgrowth of its practical character and the materials used. The treatment throughout is very simple, and the only decorative touch to be seen is in the low relief ornament of the arched ceiling.

Considering the character of the design in relation to the nature of the business carried on, it is not only successfully developed from the standpoint of utility and appearance, but what is equally important in a meat and provision store, takes into account the element of sanitation as well. All food products are displayed



VIEW TOWARDS ENTRANCE. BASEMENT FLOOR.

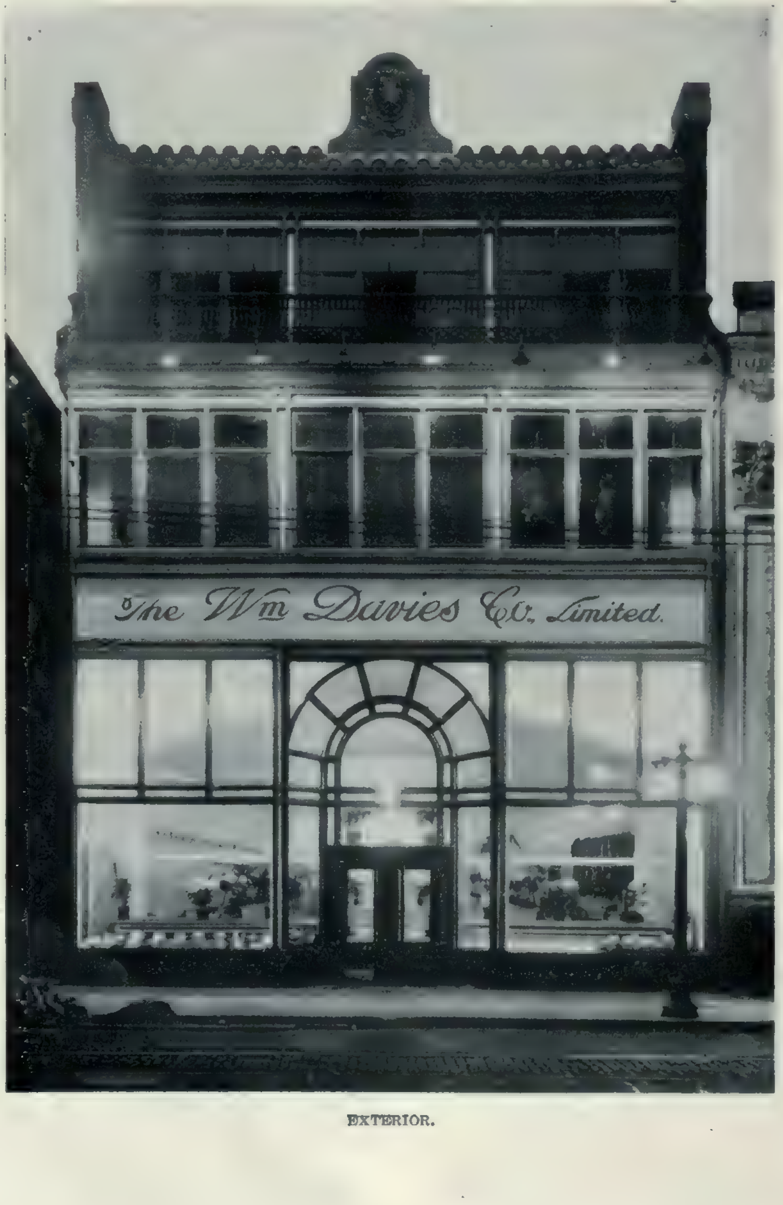
DOWNTOWN RETAIL MEAT AND PROVISION STORE OF WM. DAVIES CO., TORONTO.
HYNES, FELDMAN & WATSON, ARCHITECTS.

under glass along marble counters which extend a distance of 80 feet on either side of the wide aisle forming the public space. Both the counters and the window display space are equipped with a modern refrigerating or cooling system which ensures a constant cold temperature in all seasons. Beneath the counters are a series of compartments for the storage of supplies, and which results in an arrangement which gives the clerks the maximum of working space. A feature of these compartments is the lighting arrangement whereby the interior of the locker is automatically illuminated by electricity when the sales clerk opens the door, the light being extinguished again as soon as the door is closed.

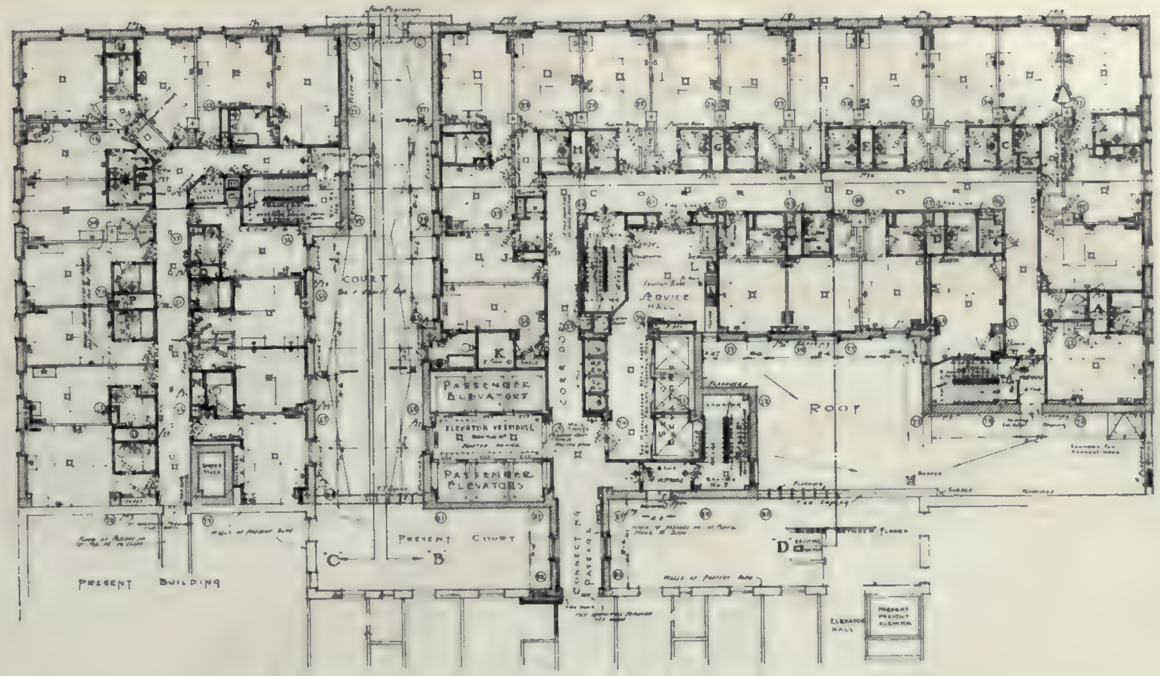
Another feature which contributes to the appearance of the place is the fact that no carcass cutting is done in the store. A large cutting room at the rear provides facilities for this purpose, thus leaving the salesman free to devote all his attention to serving customers. Apart from a little slicing of meat, no cutting is done behind the counters.

The basement section repeats to a large extent the arrangement and decorative scheme which is carried out on the floor above. Refrigerator equipment similar to that on the ground floor has been installed, and under glass-topped counters are displayed various kinds of fish — the fresh fish occupying the right hand side and smoke or cured fish the left hand side. The cashier's office faces down the store, while at the further end is situated the grocery section, equipped with appropriately designed fixtures.

Accommodations for bringing supplies into the store has been amply provided for by means of elevator to the street level. This descends into the basement, where separate storage rooms are provided in which fresh meats and fish can be held



EXTERIOR.



TYPICAL FLOOR PLAN, NEW ADDITION TO KING EDWARD HOTEL, TORONTO.

until required. A tracker bar, running the entire length of the basement on one side, permits of carcass beef being brought from the chill room to another elevator, where it is hoisted to the cutting room at the rear of the main floor.

The building, which has been remodelled for its present purpose, is four storeys in height. The facade is chiefly of glass, with the color scheme in green and white. The head office of the retail business of the company, which conducts the largest chain of meat and provision shops in Canada, is on the second floor, while on the other floors, dressing rooms and lunch rooms have been provided for the comfort and benefit of the working staff.

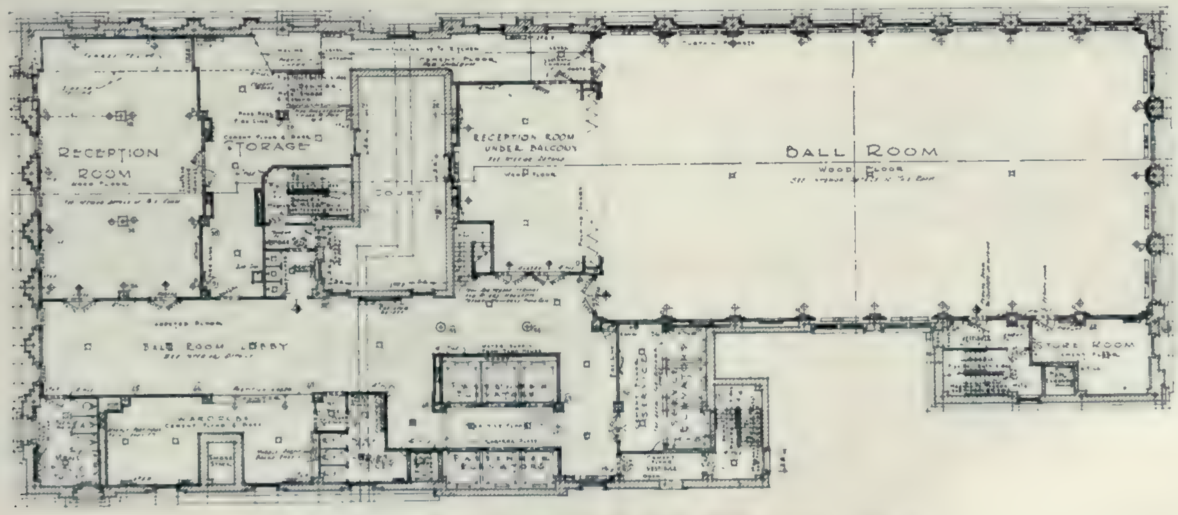
◆

King Edward Hotel Addition Toronto, Ont.

The new addition to the King Edward Hotel, Toronto, will give, when completed, an additional 530 rooms to the present hotel. The new wing takes in all the land between the easterly side of the present King Edward Hotel to Leader Lane, and is bounded on the north by King Street and the south by Colborne Street.

The promoters having dedicated to the city a portion of its property along Leader Lane, this lane will be used for vehicular traffic more than at present, and in the new hotel an entrance is located on this street extending through to the present lobby.

The new building will be eighteen stories high, the first floor will contain elevator lobby, service rooms, etc., and on King Street and Leader Lane there will be modern stores with entrances and show windows both from the street and the hotel corridors. These stores will be modern in every respect with marble floors, attractive show windows, etc., and will have ample storage rooms below each, with special service elevator for taking goods down to them.



BALL ROOM FLOOR PLAN, NEW ADDITION TO KING EDWARD HOTEL, TORONTO.

The mezzanine floor will contain lounge space, executive offices, and will also have a series of modern offices facing Leader Lane and King Street which may be rented either separately or en suite. As shown on plan it will be noticed that cafeteria on this floor has no connection with the rentable portion, it being a complete unit by itself.

Above mezzanine will be fourteen floors of guests rooms, with connections at each of the first eight floors with the present hotel which is only eight stories in height. The guests rooms will be modern in every respect, well lighted and ventilated, and every room will have a bathroom in connection with it. A small proportion of these contain showers instead of tubs. Besides the guest rooms there are the usual service halls and maids' closets, etc. All bathrooms to have tile floors and walls.

BILLIARD ROOM. REMODELLED HOUSE OF J. N. GREENSHIELDS, DANVILLE, QUE.

On the upper floor is situated the ballroom along with the necessary wardrobes, reception rooms, etc., and on the mezzanine floor, which is practically on the same level as the ballroom balcony, is a kitchen for preparation of food when the ballroom is used as a dining room.

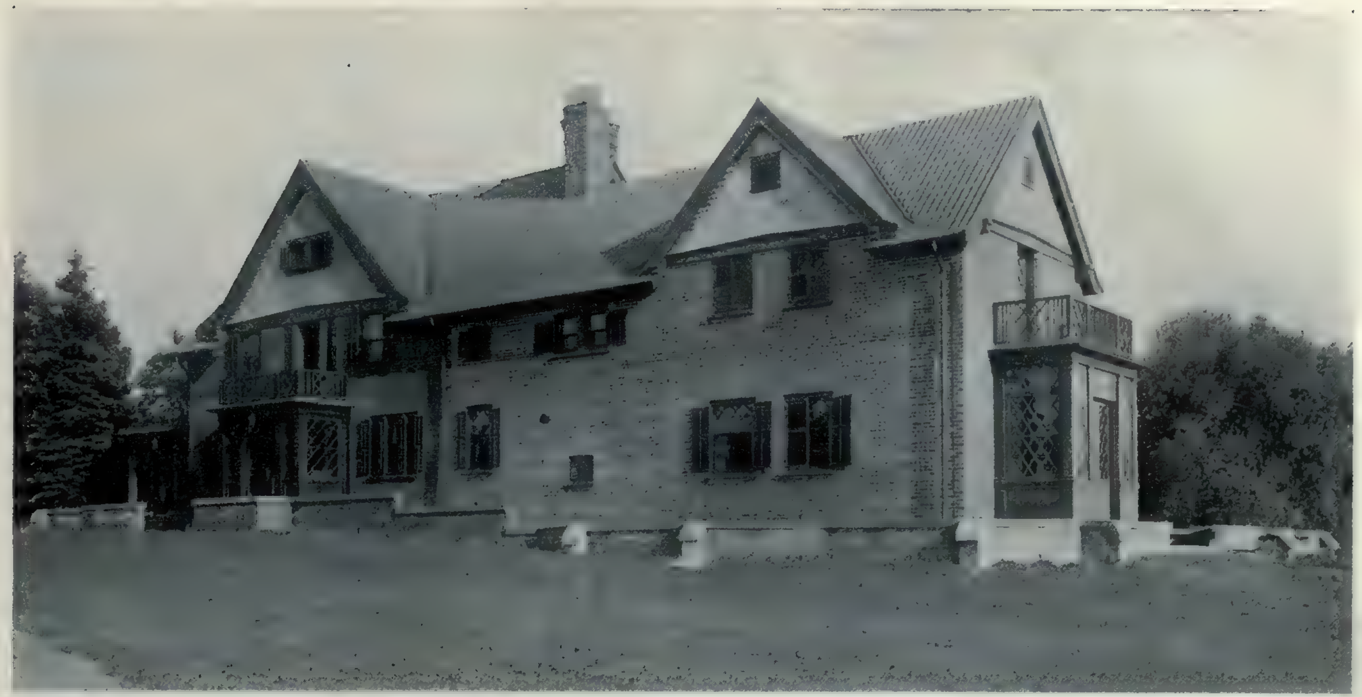
The building is fireproof throughout, being of steel skeleton construction with reinforced concrete floors. The exterior walls are faced with brick to match the present building, backed with interlocking hollow tile. Stone trimmings will be used on the lower floors and terra cotta on upper floors.

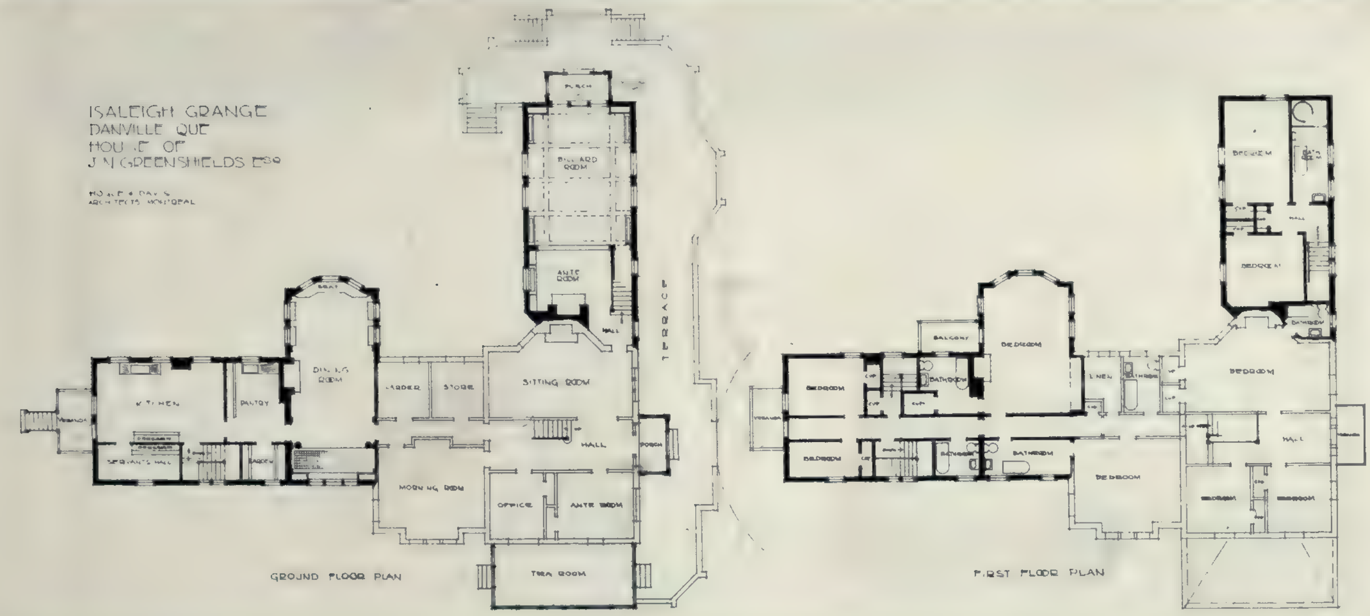
All frames and sash will be metal, and all doors between guests rooms and corridors will be fireproof, with metal trim.

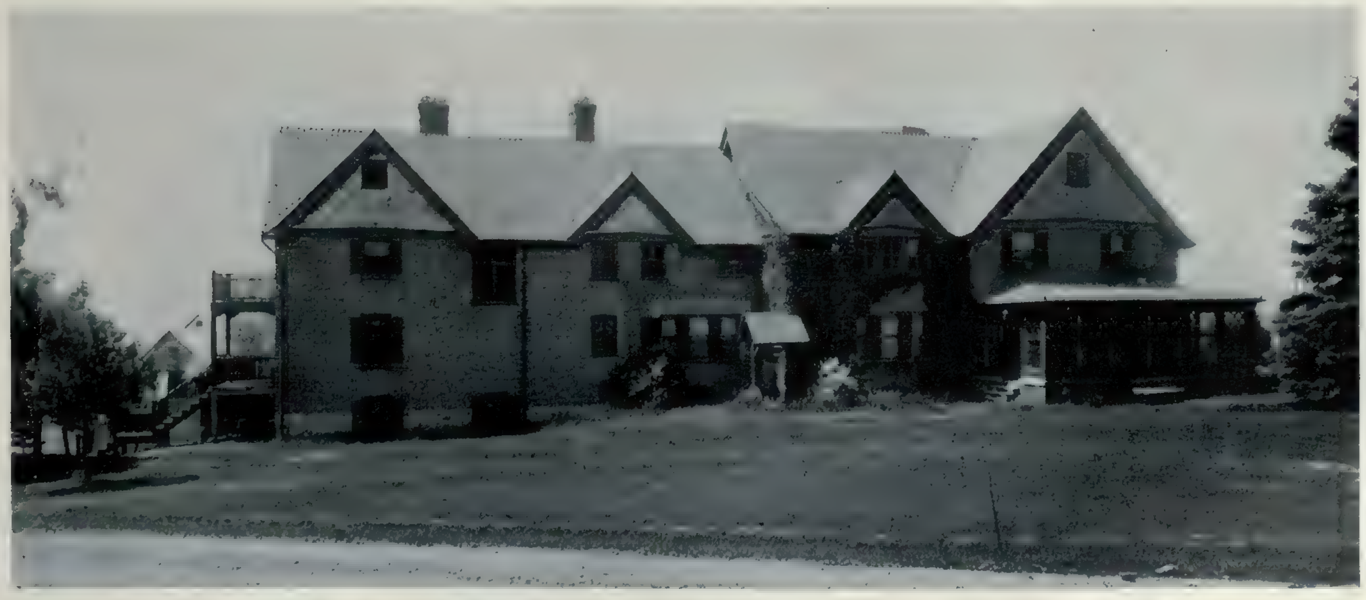
Special attention has been made for the safety of the guests in case of fire, there being more than the required number of hose-reels, and all exit-stairs are planned in such a manner that there is a vestibule at each floor open to the outside, thus in the event of a small fire breaking out in any room, there would be no danger of panic on other floors.

The plumbing and heating is to be the most modern in every respect, and it has been arranged to heat both the present hotel and the new addition from the one plant situated in the sub-basement of the new building.

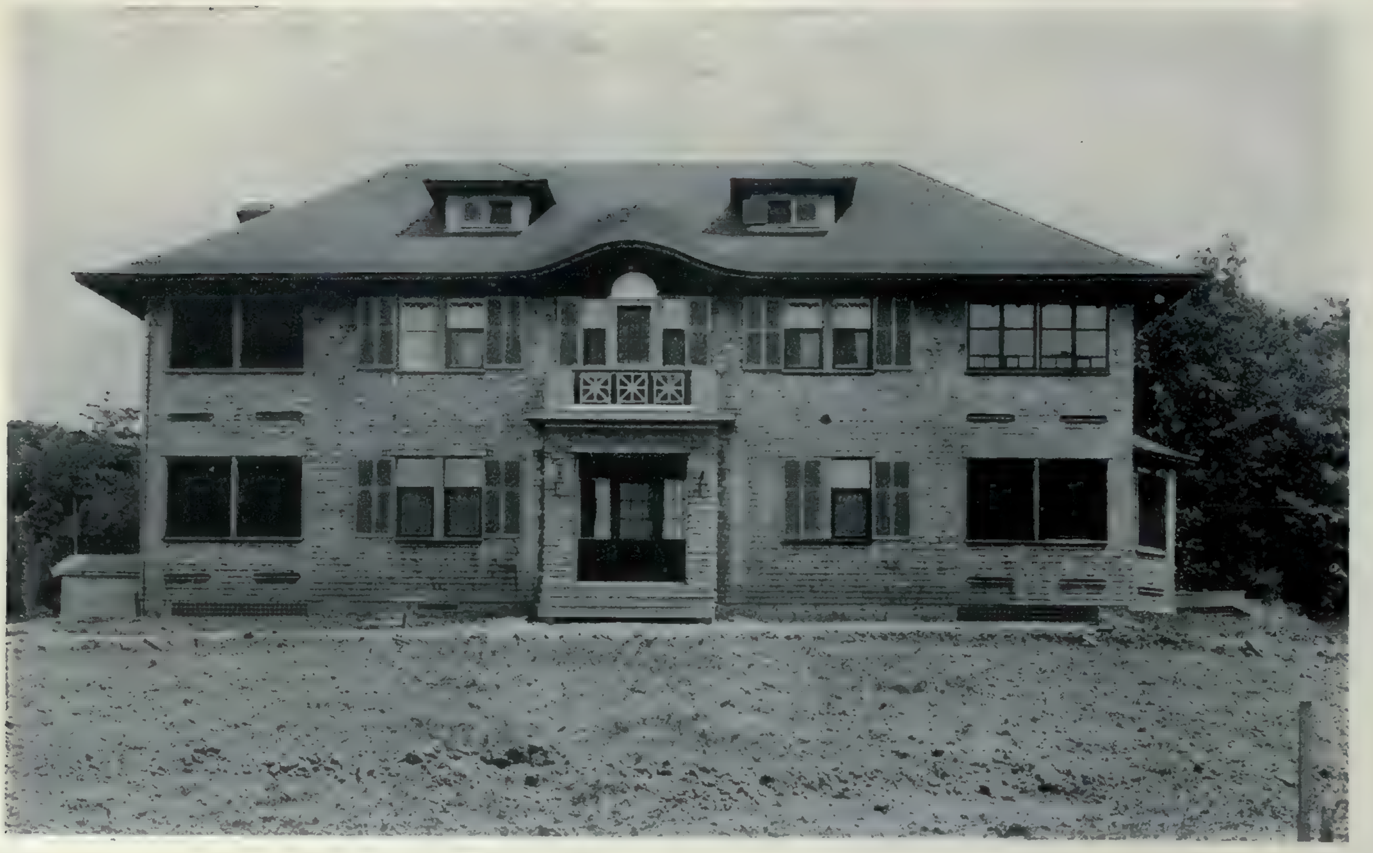
The elevator equipment of the new building will consist of a battery of six passenger and three service elevators. The passenger elevators will be of ample size and of high speed type, thus ensuring adequate service for the whole building.



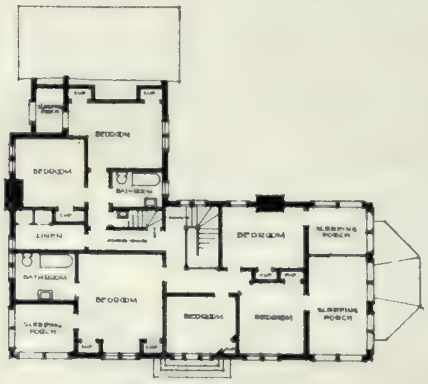




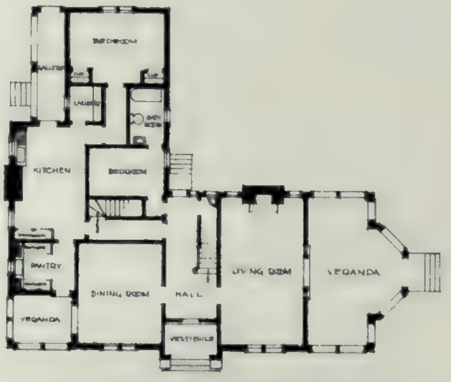
REMODELLED HOUSE OF J. N. GREENSHIELDS, DANVILLE, QUEBEC.
HOGLE & DAVIS, ARCHITECTS.



HOUSE OF MRS. MACKAY, DANVILLE, QUE. HOGLE & DAVIS, ARCHITECTS.



UPPER FLOOR PLAN.



GROUND FLOOR PLAN.

Remodelled House, J. N. Greenshields, Danville, Que.

This property has been in the possession of the family for a great many years, the original house being nearly one hundred years old, so that the owner did not wish to have the character of the place changed into that of a large "mansion," but to retain the earlier simplicity, while giving ample accommodation to a fairly large household.

Very little change was made to the existing house; the new large rooms required, namely, the billiard room and dining room being formed in the new wings. The new bath rooms required were also placed in the new wings, so that the older rooms were torn up but very little.

The billiard room wing is connected to the main house only through the sitting room. From the ante-room three steps lead down to the billiard room, and a stair leads up to the bachelors' bedrooms and bath above, thus forming a suite quite distinct from the house. All this wing is lined with B. C. fir in wide pieces with the joints covered by molded straps, with natural finish.

The dining room running through the house from side to side is lined from floor to ceiling in oak, one end being screened off with pilasters and columns to form a little flower room; this has a red tile floor. The dining room has also a wide stone mantelpiece with some delicate carvings.

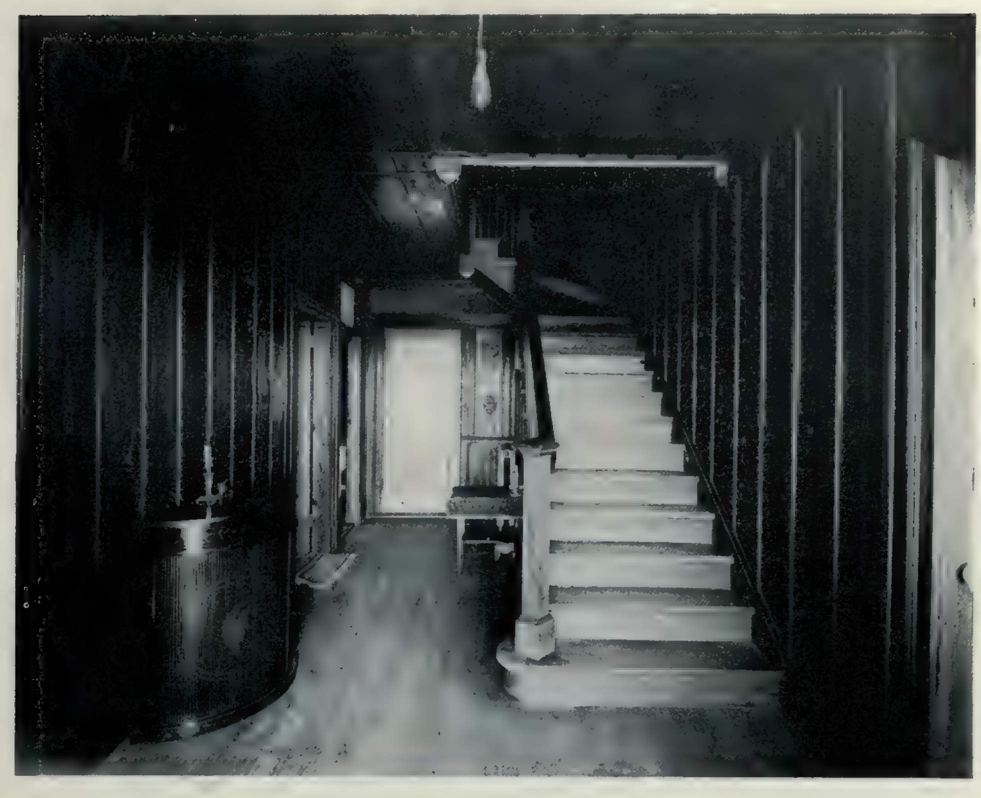
A summer kitchen is provided in the basement below the ground floor kitchen, which serves to keep the house cool in summer. The numerous bathrooms all have tile floors and tile or marble lining.

The exterior of the house is brick with the roof in metal "spanish tile" painted a dull red.

The brick has fairly wide joints and is laid rather unevenly to match the old work as nearly as possible.

A second house for Mrs. Mackay has been built on the property at the top of a long slope, and against a wood. The lines of this house have been kept very simple and the verandas included in the main structure, in order that the large scale of the setting should not dwarf the house too much. The house is of wood, shingled on both the walls and roof, and is lined with strapped B.C. fir throughout.

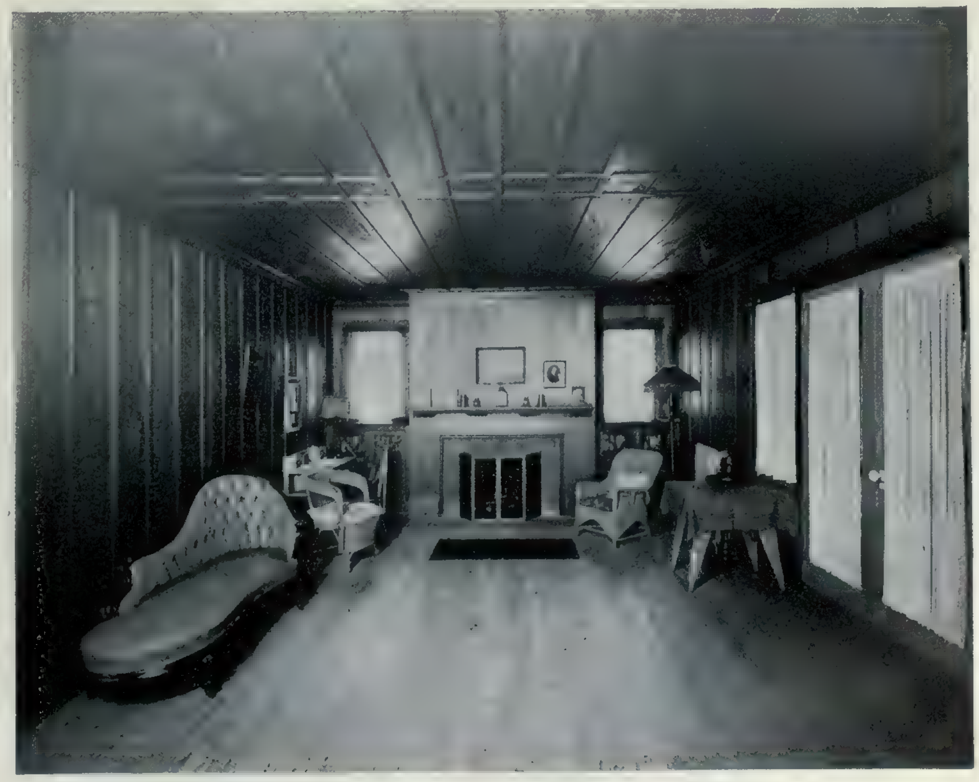
Both these houses are supplied with water from ample springs on the hill behind the new house.



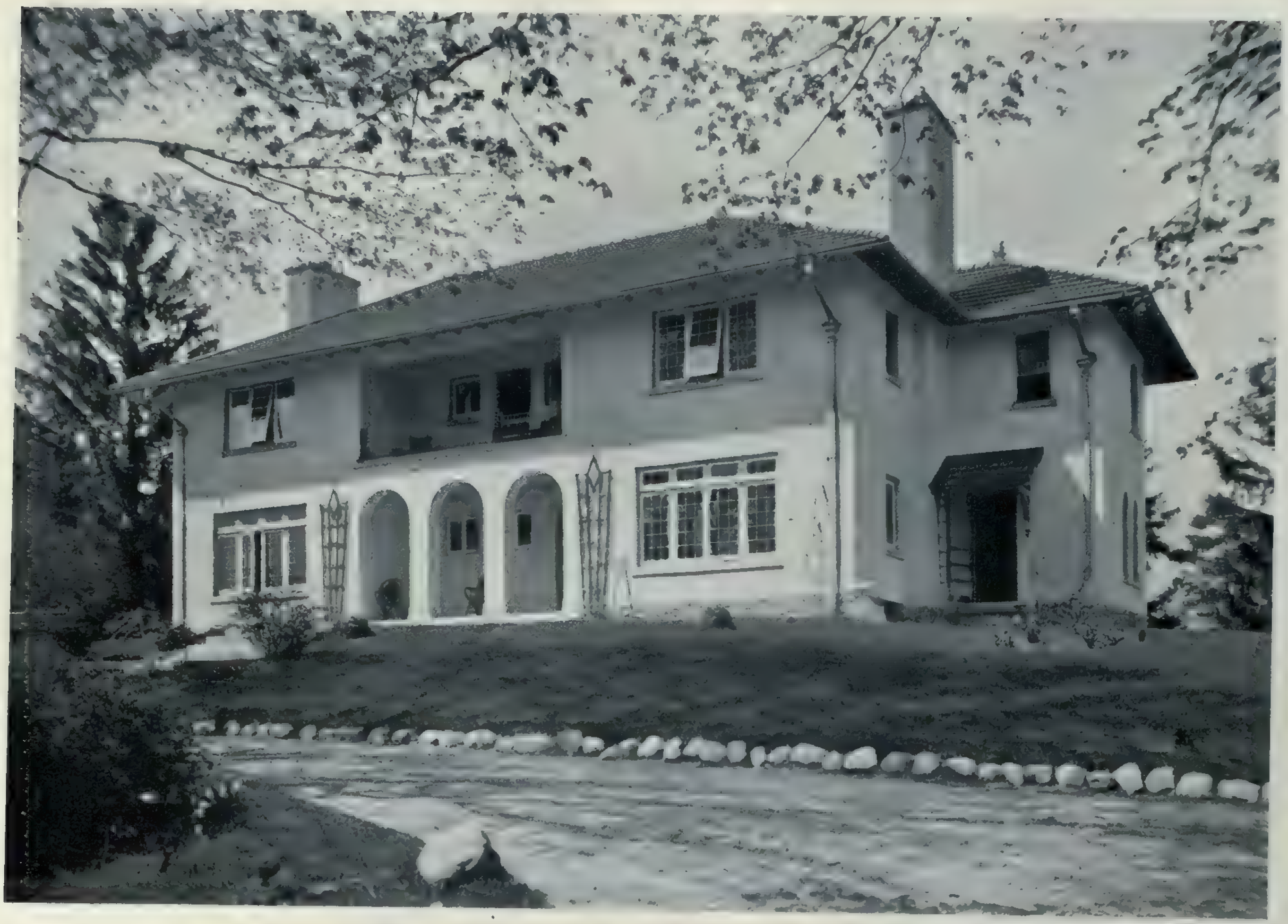
ENTRANCE HALL, HOUSE OF MRS. MACKAY, DANVILLE, QUE.

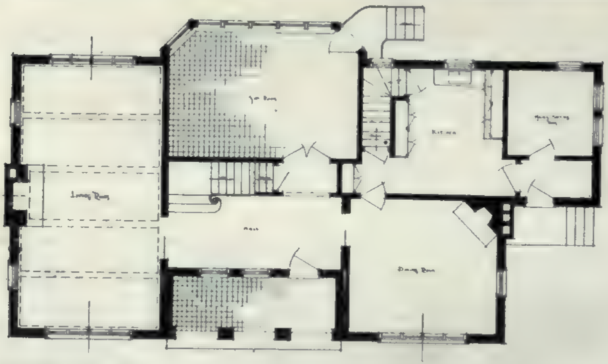
Satellite Cities

Much interest has been taken throughout England in a new plan for the building of a city about 20 miles from London on model lines. Under this Welwyn Garden City scheme it is intended that a town of ultimately about 50,000 inhabitants shall be gradually constructed as a complete unit, with its own factories, warehouses, shops, and residences, in contrast to the many districts which are almost exclusively confined to dwelling houses for people who go into the metropolis daily in pursuit of their livelihood. Such places have come to be known as dormitory suburbs, and the new scheme is based on the theory that the only solution of the whole problem of comfortable housing and convenient transport is to set up instead what are described as satellite cities, in the sense that London itself is the centre of all things, but that within a radius of 20 to 25 miles there should be a ring of these almost self-contained communities. An interesting feature of the scheme is that the capital provided will only receive a maximum interest of 7 per cent., and as the town is gradually built any increment of values arising from the settlement of the people will be conserved for their own social advantage.

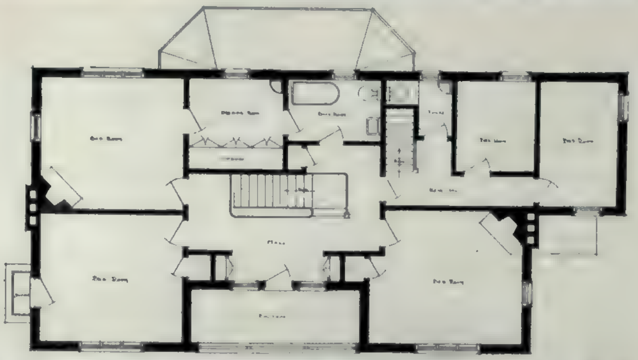


LIVING ROOM, HOUSE OF MRS. MACKAY, DANVILLE, QUE.

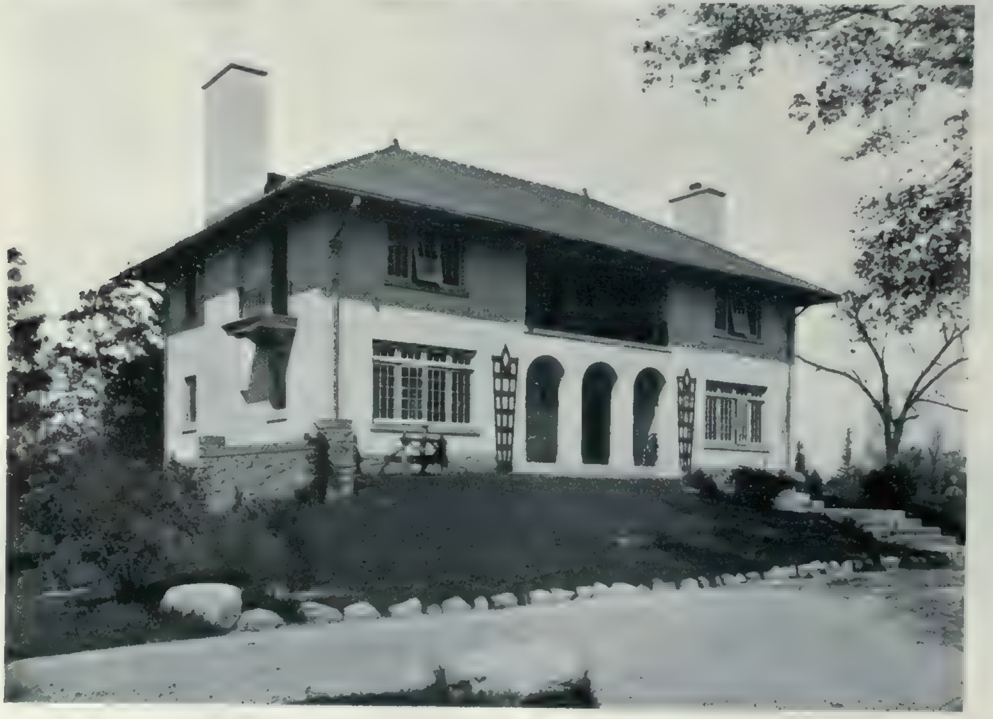




GROUND FLOOR

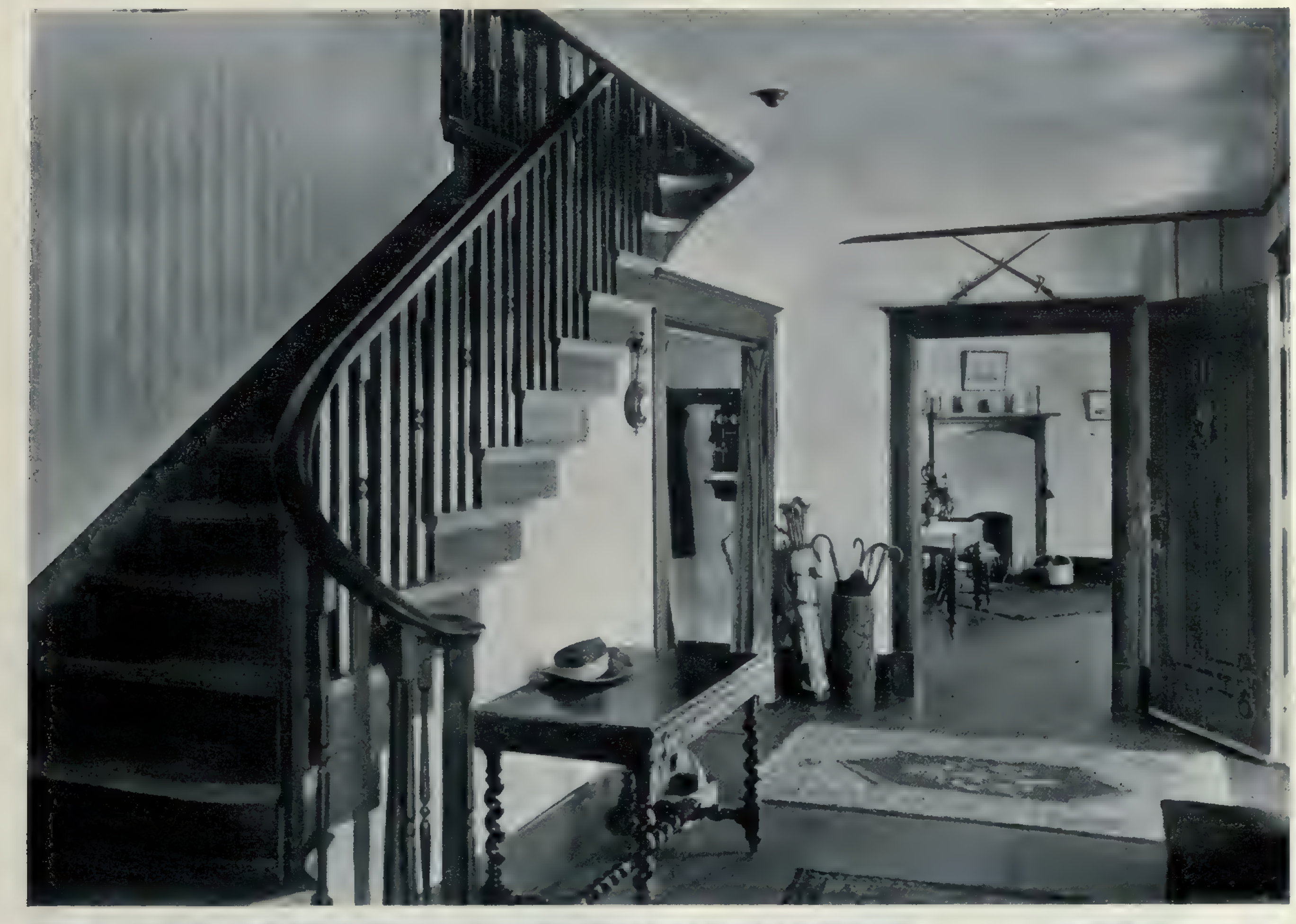


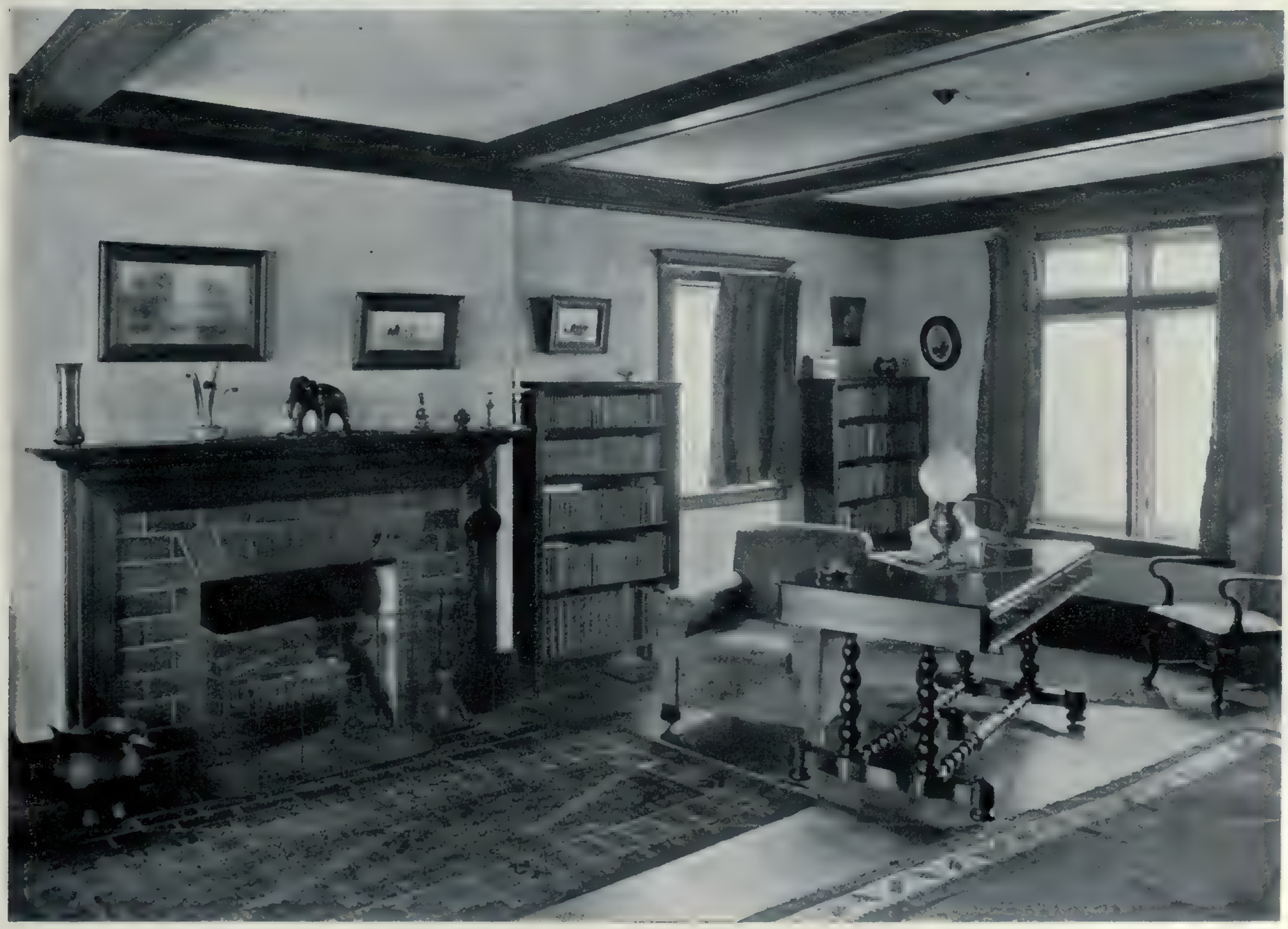
UPPER FLOOR



COUNTRY RESIDENCE OF COL. H. WILLIAMS, M.D. TOWNSHIP OF LONDON.

JOHN M. MOORE, ARCHITECT.





ENTRANCE HALL.

LIVING ROOM.

COUNTRY HOUSE OF COLONEL H. WILLIAMS, TOWNSHIP OF LONDON.
JOHN M. MOORE, ARCHITECT.

The Use of Steel in House Construction

The phrase "Steel Frame Building" is generally associated with large structures such as hotels, office buildings, etc., and it is only recently that the full possibilities of the use of steel framing in small dwelling houses have been realized. Within the last year a system of house construction has been developed by a large industrial concern in the North of England in connection with a Garden City scheme now being carried out for the housing of the firm's employees.

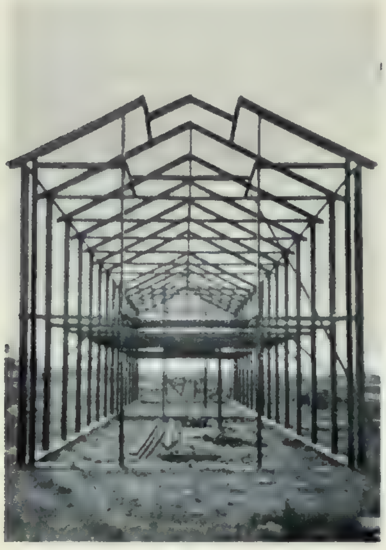


FIG. ONE.

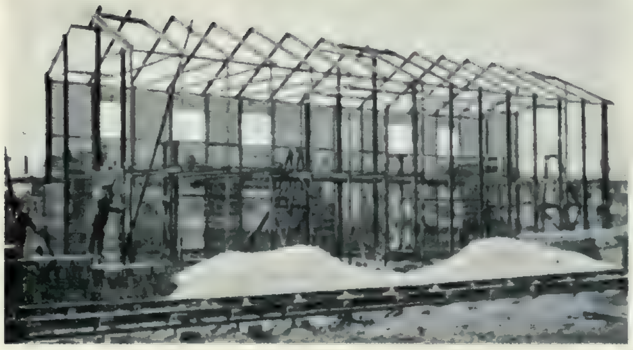


FIG. TWO.

A type of house has been evolved consisting mainly of a self-supporting steel frame covered with reinforced concrete, the nature of the covering being the same for walls, floors, roof and, if desired, the bedroom ceiling also.

The steel work necessary for a house, according to Steel Structures, an English publication, consists of a series of transverse frames set at regular intervals of about 4 ft., each frame consisting of two uprights, one floor beam and a light roof truss. This spacing of 4 ft. was found to be the most economical, inasmuch as it gave suitable space for the sizes of cottage windows and doors, and also enabled the wall, floor and roof construction to be used to the best advantage.

The design of the house was worked out by studying the house plan, the steel frame and the architectural requirements at one and the same time; and it may be remarked here that such procedure is absolutely necessary in order to apply the use of steel framing most successfully. The steelwork is more than a system of supports for the other classes of materials necessary to construct a house. It is the basis for the design of the whole house and requires the treatment of room arrangement, window spacing and chimney brickwork to be considered from a different viewpoint from that obtaining in an ordinary brick house.

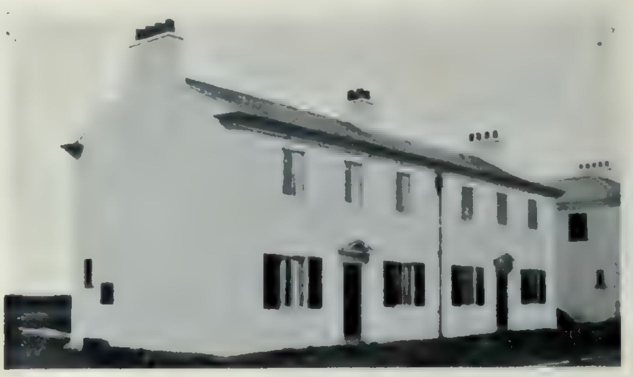


FIG. THREE.

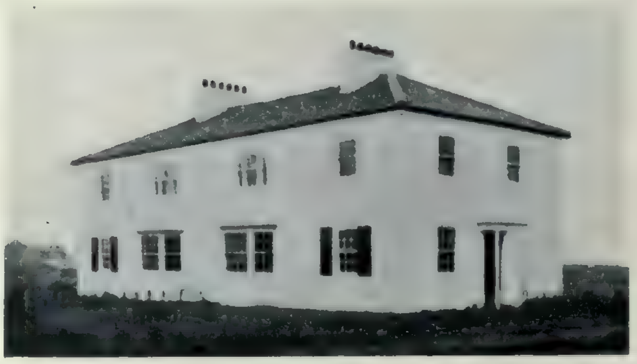


FIG. FOUR.

In designing houses upon this system, our contemporary points out, it is desirable on account of the small size of the structure that complications such as an irregular ground plan, haphazard arrangement of fireplaces, elaborate dormers, valleys and gables are to be avoided. In order to obtain simple and economical connections, rolled steel channels, angles and flats have been principally used in the construction of these houses. All site connections are bolts, and there is very little shop rivetting necessary.

The steel framing, it is stated, has been found, in practice, remarkably speedy and easy to

(*Continued on page* 230.)

Greek Design

By JAY HAMBIDGE.

Read before the Royal Institute of British Architects.

WHEN we measure the greatest length and the greatest breadth of a Greek temple, a Greek unit of pattern, a Greek bronze or a Greek vase of the best period, we obtain the end and side of a rectangle. The lines which we thus obtain are almost always incommensurable or unmeasurable one with the other. As areas, however, these rectangles possess a fascinatingly curious commensurability. They are extremely easy to construct and, moreover, belong, or may be reduced, to one or two classes. Further, we almost invariably find that the details of a Greek design are logical parts of its containing rectangle. In fact this is the acid test by which we determine the grade of planning knowledge possessed by the classical designer. For example, if we measure the greatest height and the greatest width of a fine vase in bronze or clay we find that the width of the foot, its height, whatever definite sub-divisions there may be, the width and height of the lip, the height and width of the neck, and, in the great majority of cases, the ornamental band usually found underneath pictorial compositions, are all logical and direct sub-multiples, of a peculiar kind, of the containing or overall rectangle. If this doesn't prove to be the case, then the example is excluded as an exception.

When Greek designs were first measured the astonishing fact was revealed that the measured lines were incommensurable—*i.e.*, one line could not be divided one into the other. In later days certain enthusiastic archæologists claim to have discovered round numbers in some Greek measurements. It has been claimed, for example, that the stylobate flank was exactly 200 Olympic feet. Without questioning the accuracy of the modern interpretation of the Olympic foot, or accepting it as established, the fact remains that other lines of the ground plan, such as the facade width, the enclosing or sub-dividing lines of the cella, etc., cannot be divided into this so-called line of 200 feet. But, if we take this same temple plan and consider the rectangle it furnishes, also the rectangle of the plan of the cella and the column arrangement, we see immediately that they belong to a class of rectangular shapes which seem to have been well known to Greek designers for generations. Moreover, we recognize at once that the architect of the Zeus temple used a different type of rectangle from those we find on the Acropolis at Athens. Theoretically we should find round numbers in some shape in Greek design, but it is not likely that we shall find them more than once or twice in any specific example.

This is a very astonishing situation. As practical men, we know that, before works can be carried out by workmen, some measuring method must be employed which produces commensurability. For this purpose we use the foot or the metre, and divide it into even fractional parts. An exhaustive investigation of classic design shows clearly that in the early part of the sixth century B.C. Greek craftsmen were using a measuring method wherein commensurability of lines was an essential feature. And that some time during this century a change was made from the older to a newer system. The essential base of this new method was incommensurability of lines, but measurableness of area. The first system depended upon a unit of some sort. It is not necessary for us to know what this unit was; it may have been a cubit, a foot, a hand, or something quite arbitrary. The point to bear in mind is that measurableness of line or area will always remain measurable, no matter what the unit may be. A diagonal to a square in relation to a side, for example, will remain a diagonal to a square whether we use a foot, a metre, or any other length unit, or whether we fix it arbitrarily by construction. It is because of this fact that we are able to create an instrument for analysis which will determine accurately the character of a measuring scheme in any terms we may decide to select. The determination of the character of a measuring method in design in reality means the determination of the grade of *symmetry,* using the word in its Greek sense of analogy or relation of part to whole.

In this connection it is advisable to stress the point that design means very much what the word implies—that is, *intention.* Before we recognize a design as such there must exist in it an arrangement of elements of some sort which bear to each other and to the whole some degree of relationship. This may be conscious or unconscious on the part of the creator of the design. That there was intention on the part of the designer to make this relationship depend upon a definite proceeding, at certain periods of man's design history, we know, because treatises written upon the subject, as well as plans themselves, have survived. For the purpose of determining the grade of symmetry in a design, however, there is nothing better than the design itself, providing that we have the proper instrument for analysis. Recognition of the necessity for such an instrument led the writer, some twenty-three years ago, to undertake an examination of the bases of symmetry in nature. Five years later, in the autumn of 1902, a preliminary paper upon the subject was read before the Hellenic Society in London. At this time a minor phase of symmetry phenomena had been formulated. Later, during the winter of 1913, the entire scheme was developed and arrangements made for the reading of a concluding paper before the same Society, during the autumn of 1914. The coming of the war caused a postponement until 1919.

Examination of natural symmetry developed the fact that there were but two phases of this phenomena which could be of use to design. One of these is observable in the crystal and in other regular pattern forms. The snow crystal is an excellent illustration. Because of certain characteristics this was given the name of *Static Symmetry.* The other phase is to be seen in the phenomena of leaf distribution in plants, and in the curious assymmetrical balance of form in the shell. This, because it appeared to be the orderly arrangement of elements in growth, was given the name dynamic symmetry.

Examination of man's design efforts developed the striking fact that there existed a parallel between these and nature. It was found that the static type was more or less spontaneous; was indeed the type used consciously or unconsciously. This type, very often, is apparent by inspection, and in such cases it is not necessary to measure a design. It is difficult to believe, however, that the *dynamic* type could be employed unconsciously. When the general principles inherent in these two types of symmetry had been worked out, and their operating technique developed, it was found that the static was the type existing in the design products of all nations excepting the Egypytian and the Greek; also that it is historical that the Greeks had practically exhausted many phases of this dynamic type, probably as early as the beginning of the fifth century B.C.; that, as early as the fifth, some think the eighth, century B.C. the Hindus were familiar with many of the basic facts of dynamic symmetry. We learn this from an early Hindu work which has survived termed Sulvasutras. "The term *Sulvasutra* means 'the rules of the chord,' and is the name given to the *Kalpasutras,* which treat of the construction of sacrificial altars." Those curious to read about this interesting matter should consult "Indian Mathematics," by George Rusby Kaye, Calcutta and Simla.

The Indian phraseology in this old work, in the light of dynamic symmetry, is of curious interest. Some of it is:

(1) A cord stretched across a square produces an area of twice the size.

(2) Take the measure for the breadth, the diagonal of its square for the length; the diagonal of that oblong is the side of a square the area of which is three times the area of the (generating) square.

(3) The diagonal of an oblong produces by itself both the areas which the two sides produce separately.

(4) This is seen in those oblongs whose sides are three and four, twelve and five, fifteen and eight, seven and twenty-four, twelve and thirty-five, fifteen and thirty-six, etc.

The oblongs described in (1) and (2) are root-rectangles, and are identical with those we know, from history, that the Greeks worked out. The Greek phraseology, however, was "the determination of a square which should be any multiple of a square on a given linear base" (see Allman's "History of Greek Geometry," from Thales to Euclid).

The oblongs described in (3) and (4) are the triangles of history by which the rope-stretchers established right-angles and "corded the temples." The 3 and 4 oblong has 5 for a diagonal, 12 and 5 has 13, 7 and 24 has 25, etc., etc. It will be noted that the Hindu uses the term oblong. This immediately suggests the Pythagorean rule for the determination of right-angles by numbers, beginning with odd numbers. Take an odd number, say 3, square it and subtract unity, divide the result by 2: 3 multiplied by 3 equals 9, and 9 minus 1 equals 8, 8 divided by 2 equals 4, the second term; add unity, to obtain 5. This is the celebrated 3 4 5 triangle of Pythagoras, which has been in use for fixing right-angles from early Egyptian days to the present. Later Plato supplied a rule for finding right-angles beginning with even numbers (see Ballo, "Short History of Mathematics"): I have seen a carpenter in America establish a right-angle by a rope divided into twelve parts, and lay out his plan on the ground for a garage. Asked for the meaning of the proceeding, he replied that he supposed everybody knew the principle; he had known it since apprentice days. The historical method was to take a rope divided into twelve units; place three of these along an established line, four the other way, and permit the remaining five units to form the hypotenuse. This consideration of the right-angle leads us immediately to the crux of the matter of symmetry in Egyptian and Greek design, and one of the most interesting glimpses of ancient craft practice is furnished by the etymology of a Greek word. An explanation of this point will be found in Gow's "Short History of Greek Mathematics."

"The Greek philosopher Democritus is quoted by Clement of Alexandria as saying: 'In the construction of plane figures (lit., composition of lines), with proofs no one has yet surpassed me, not even the so-called Harpedonaptæ of Egypt.' It was evident, of course, that these Harpedonaptæ were famous geometers, but Professor Cantor has first pointed out that their name is compounded of two Greek words and means simply 'rope-stretchers.' He explains their function in the following way: 'There is no doubt that the Egyptians were very careful about the exact orientation of their temples and other public buildings. But inscriptions seem to show that only the north and south line was drawn by actual observation of the stars. The east and west line, therefore, was drawn at right-angles to the other. Now it appears, from the practice of Heron of Alexandria, and of the ancient Indian and probably also the Chinese geometers, that a common method of securing a right-angle between two very long lines was to stretch around three pegs a rope measured into three portions which were to one another as 3:4:5. The triangle thus formed is, of course, right-angled. Further, the operation of rope-stretching is mentioned in Egypt, without explanation, at an extremely early time Amenemhat I).' "

Sir Norman Lockyer, in his "Dawn of Astronomy," furnishes us with some pertinent Egyptian wall inscriptions bearing upon this matter of "cording the temple." It seems to have been an important ceremony, and the king, accompanied by the appropriate goddess, drove the pins with a golden hammer.

The historians tell us that the Egyptians were regarded by the Greeks as masters of figure dissection. From the above the rope-stretchers must be included in this class. The present investigation of design bases suggests unmistakably that these rope-stretchers were equivalent to the modern surveyor. Herodotus tells us that the annual overflow of the Nile destroyed property boundaries and created much confusion and dispute. To re-establish these boundaries frequent re-survey was necessary. If rope-stretching was a recognized science asearly as the time of Amenemhat I. the beginning of the practice must have long antedated that period. It must have taken many centuries to develop skill so publicly recognized.

Dynamic symmetry shows us that it must have been out of some such practice as rope-stretching or surveying that the basic ideas of correlated or formal design in both Egypt and Greece developed. We may take any one of the right-angled triangles which are obtainable from the rules of Pythagoras and Plato and obtain readily, and with the utmost accuracy, all the proportions which we find in classic design.

It will probably have occurred to the audience that dynamic symmetry, in its essentials, is simply a method of measuring. This is indeed true. Design analysis in general shows that the spontaneous method of measuring is linear. In our day we use the linear unit; but this method produces static symmetry of the most commonplace kind. A much better grade of the static variety was used during the Middle Ages. The facts appear to justify the assumption that some genius, undoubtedly in Egypt. but possibly in Greece, after a linear scheme had been in use for some time, made the extraordinary discovery that another method of measurement was possible: that a diagonal to a square, used in relation to a side, produced shapes which, while incommensurable as lines, were delightfully measurable as areas. The fascinating series of root-two shapes which Greek design supplies rest upon this side and diagonal relationship. Later still some other observant designer hit upon the idea that the diagonal to two squares, in relation to the side of one of the generating units, supplied a much more powerful and flexible method of area measurement. This latter method is the most satisfactory scheme so far discovered for correlating the elements of design.

To us the interesting aspect of the matter lies in the fact that a diagonal to two squares is the base of the phenomena of leaf distribution in the vegetable world. Modern botanical research has sufficiently established this.

Owing to his understanding of a method of measuring by areas so simple—indeed, that a string and a few pins or a string merely held in the two hands is all the instrument necessary—the Greek designer had knowledge of an infinite series of remarkable shapes entirely unknown to the modern designer. We may use strong emphasis on this point because extraordinary precautions have been taken to ensure accuracy of results. The Parthenon at Athens, of course, stands on Penrose's measurements. When we consider the ground plan of this building as a rectangular area (this are must include the Euthynteria or lowest levelling course), and divide the end into the side, we obtain a ratio which is immediatel yrecognizable as belonging to the series of dynamic shapes mentioned. Penrose was most painstaking in his survey of this building, so we may take his figures, and without making a drawing or diagram prove the correctness of the measurable area scheme by a little arithmetic. When we follow out the logical process of subdivision, which is a peculiar property of this particular rectangle, we find that every detail of this ground plan forms part of an arrangement wherein the basic design idea is similarity of figure. The main motive is a square plus an area obtianed from a diagonal to two squares. The principle by which the subdivisions are obtained depends upon establishing a reciprocal to the major idea. This idea of a reciprocal to a shape seems to be quite unknown to modern design, but there is overwhelming evidence that Greek designers thoroughly understood it. The division of the area of the Parthenon ground plan results in an arrangement of similar figures in which the column centering plays the most important part: this includes the relationship of the neighboring columns to the angle columns. The error throughout is the error of workmanship, as Penrose's measurements disclose it. After the ground plan we may take the facades and all of their details, such as columns, architrave, triglyph, and metope or pediment. Further, we may unfold the buildings—*i.e.*, place the front and side elevations, with half the roof on either side, in two-dimensional position on the four sides of the ground plan and obtain another larger rectangle. In this shape every superficial square inch of the exterior of the building may be inspected. This new rectangle will be found to belong to the same base as the rectangle of the ground plan. In other words, the building supplies us with an area theme of a peculiar character. Moreover, it is easily proven that this particular theme has a base in nature.

During the past year and a half Dr. L. D. Caskey, Keeper of Greek and Roman Antiquities of the Museum of Fine Arts, Boston, has devoted his entire time to the preparation of a large volume on the Greek pottery under his care, wherein the whole fabric is scholarly and exhaustively treated in the light of dynamic symmetry. Dr. Caskey's work is corroborative in every detail of the dynamic theory. At the Metropolitan Museum of Art, New York City, Miss G. M. A. Richter, Keeper of Greek and Roman Antiquities, took unusual precautions to obtain reliable measurements. The pottery was first measured in detail by a secretary and a rough sketch made of the example. This material was sent to me at Boston. From these measurements I quickly determined the grade of symmetry of each example. An expert draughtsman, with the assistance of a few specially prepared instruments, made an accurate drawing of the projection of each example. These were also sent to me, the drawings being first inked, so no changes could be made. If these drawings and measurements did not coincide the example had to be reinspected. Later I made an interpretation of the straight line and curve proportions of all the examples. It should be borne in mind that it is not necessary to make a drawing of any example of Greek classic design: a few measurements settle the matter. So far classic design shows something like 80 per cent. based upon a diagonal of two squares as a measuring base; approximately 10 per cent. on the diagonal to one square, 5 or 6 per cent. static, the remainder indeterminate.

We obtain the same percentage from the British Museum. I have been gradually obtaining examples of Greek bronzes of the best period, both here and in America. The results show even a higher quality of symmetry than the pottery. I stress the importance of the Greek vase because it has developed that this pottery is the only pure architectural pottery. Almost nothing is known about the shapes of this extraordinary fabric, while volumes have been written on the paintings and drawings on them. The Greek vase compels our admiration, and has persisted as an object of rare beauty probably because of its exquisite proportions and shape. The paintings are often inferior. Professor Baur, of Yale University, has pointed out that the Greeks themselves thought thus because we find more signatures of designers than of painters. Edmond Pottier, Keeper of Greek and Roman Antiquities in the Louvre at Paris in 1906, had to say of the proportions found in Greek vases:

"I will add that the proportions of the vases, the relations of dimensions between the different parts of the vessel, seem among the Greeks to have been the object of minute and delicate researches. We know of cups from the same factory, which, while similar in appearance, are none the less different in slight, but appreciable, variations of structure (n'en sont pas moins differentes par des nuances appreciables de structure) (*cf.*, for example, Furtwangler and Reichold, 'Griechische Vasenmalerei,' p. 250). One might perhaps find in them, if one made a profound study of the subject, a system of measurement analogous to that of statuary. We have, in fact, seen that at its origin the vase is not to be separated from the figurine (p. 78); down to the classical period it retains points of similarity (*accointances*) with the structure of the human body (Salle). As M. Froehner has well shown in an ingenious article ('Revue des Deux Mondes,' 1873, c. civ, p. 223), we ourselves speak of the foot, the neck, the body, the lip of a vase, assimilating the pottery to the human figure. What, then, would be more natural than to submit it to a sort of plastic canon, which, while modified in the course of time, would be based on simple and logical rules? I have remarked ('Monuments,' Piot IX, p. 138) that the maker of the vase of Cleomenes observed a rule illustrated by many pieces of pottery of this class when he made the height of the object exactly equal to its width. M. Reichold (c. 1, p. 181) also notes that in an amphora attributed to Euthymides the circumference of the body is exactly double the height of the vase. I believe that a careful examination of the subject would lead to interesting observations on what might be called the 'geometry of Greek ceramics.'" (E. Pottier, Musee National du Louvre, "Vases Antiques, III," p. 659.)

THE PARTHENON PLAN SCHEME.

The Parthenon plan must be considered as a straight line or rectangular area arrangement. The curves are refinements added after the plan was developed. (See Penrose and Prof. Wm. H. Goodyear.) Dynamic Symmetry shows us that a Greek design must be considered in its totality—*i.e.*, the entire or overall dimensions must be contained exactly in some definite rectangle. For a Greek building these overall dimensions must include the Euthynteria or lowest levelling course. The width of the end of the stylobate of the Parthenon is 101·341 English feet. Penrose gives the width of the three steps as 4·65 feet on one side and 4·67 on the other. The width of the Euthynteria as a small step is ·33. This added to 4·65 equals 4·98; to 4·67 it is 5·. For convenience of arithmetical calculation we may assume that 5· is correct. Multiplied by 2 we obtain 10· English feet as the width of the steps on either side of the stylobate. The full width of the end of the rectangle of the ground plan therefore is 111·341 feet. The length of the top step on the flank is 228·154+; with 10· added it is 238·154+.

111·341 divided into 238·154 equals the ratio 2·1382.

111·341 multiplied by 2·1382 equals 238·069, actual error ·045 feet. The actual ratio should be 2·13819+. We have a degree of accuracy here which is difficult to realize in a building built by man.

Students of dynamic symmetry will immediately recognize the ratio 2·1382 as a compound shape composed of two familiar areas which are arithmetically represented by 1·4472 plus ·691. Of the ratio 1·4472 the whole number 1· represents the area of a square and ·4472 is a root-five rectangle. The square root of five is 2·2360 and this number, normally, would be the ratio for a root-five area—*i.e.*, a rectangle the end of which is 1· or unity and the side 2·2360 (N.B.—These areas may be scaled sufficiently close for an ordinary drawing by using a metric scale. In the present case the root-five area is standing on its short end with its side against the side of a square, consequently the side is regarded as unity or 1·. The short end must be in root-five proportion to unity—*i.e.*, the area must be a reciprocal of the root-five area. This notion of a reciprocal is entirely new to modern design, but we have abundant evidence that the Greeks thoroughly understood its functions. A reciprocal of a root-five rectangle—or indeed any root area—may be obtained by dividing the number representing the root into unity or 1·0. A root rectangle always contains an even number of reciprocals. A root-five rectangle contains 5 reciprocals, root-four 4, root-three 3, root-two 2, etc.

2·2360 divided into 1·0 equals 0·4472, or

2·2360 divided by 5 equals 0·4472.

The ratio 1·4472 is now clear. The simple geometric method for the construction of this area is as follows:

Construct a square and bisect the area by the line A B, Fig. 1, *a* (p. 221). Draw the line B C. This is a diagonal to two squares. Make B D equal to B E and through E draw F G parallel to B D. The area F D is a root-five rectangle. F G is equal to unity or 1·0 and G D is equal to 0·4472. In Fig. 1*b*, the root-five area C B is added to the square A B, and A D is a 1·4472 rectangle. The fraction 0·691, because it is less than unity, must represent a reciprocal of some ratio greater than unity. To obtain this ratio we divide 0·691 into 1·0. The result is 1·4472. A reciprocal of a rectangular area is a similar shape to the whole, therefore a 0·691 area is also composed of a square plus a root-five rectangle.

The geometrical method for the construction of a 1·4472 shape plus its reciprocal is shown in Fig. 2.

A B is a diagonal to a 1·4472 area. B C is a diagonal to a 0·691 area. The two lines form a right angle at B.

General methods for geometrically determining reciprocals are shown in Fig. 3 *a* and *b*.

A C, Fig. 3 *a*, is any rectangle. A B is a square on the end of the rectangle "applied" to the area of the rectangle, and E D is a diagonal which cuts F B, a side of the square A B at G. The line G B is the end of a reciprocal to the major shape. A B, Fig. 3 *b*, is any rectangle, and D C is a diagonal, A F D is a semicircle described on A D, the end of the rectangle. The diagonal D C cuts the semicircle arc at F. Draw A E through the point F. The area A E is a reciprocal and a similar shape to the whole. Diagonals of reciprocals cut diagonals of the whole at right angles and introduce continued proportion into the area of a rectangle. E F is to F D as F D : F A : F C; or E D : D A : D A : A C, etc. A F D is a triangle in a semicircle, and, consequently, is a right-angled triangle.

Referring to the Parthenon ground plan, A B, Fig. 4, is a 2·1382 rectangle, A G a 1·4472, and C B a 0·691 area.

A D is a square "applied" to A G, and C I, a diagonal, cuts J D at F. The line F D is equal to G B. Draw the line F H parallel to D B. C D is a root-five rectangle as is also H C. A D, B K are squares.

The area C H, Fig. 5, is a root-five rectangle. This area is composed of a square plus two 0·6180 shapes, 1·0 plus 0·618 plus 0·618. This area, represented by the fraction 0·618, is a rectangle which has been given the name, by the writer, of the "rectangle of the whirling squares," because of a certain property possessed by its reciprocals. If 0·6180 be divided into 1·0 the result is 1·6180. The geometrical method for the construction of this shape is shown in Fig. 6 *a* and *b*.

A B, Fig. 6 *a*, is a square. B C, a side, is bisected at D and D E drawn. D E is a diagonal to two squares. D F is made equal to D E. The rectangle A F is completed. This area is a rectangle of the "whirling squares." A C is unity or 1·0, and C F is equal to 1·6180. C B is equal to 1·0, and B F 0·6180. F E is a reciprocal to F A. The square-root of five is 2·2360. If to 1·6180 the fraction 0·6180 be added, the result is 2·2360. In Fig. 6 *b*, C D is a square. D F, a side, is bisected at E and E G, a diagonal to two squares, drawn. E G is made equal to E B or E H. H C G B is a semicircle; H C, G B are 0·6180 rectangles. A D, B C are 1·6180 rectangles. A B is a root-five rectangle composed of a square C D plus the two 0·618 shapes B G, A F.

A B, Fig. 7, is a 2·1382 rectangle. C D is a root-five rectangle, and D F an area composed of two 0·6180 shapes. To the 0·691 area B D we apply the root-five area B G, equal to C D. B K is a square, and K L two 0·6180 areas; and H F is composed of two 0·6180 areas; and J K is a square greater in area than the squares B K or C E. To the other end of the rectangle A B we "apply" the squares A M and N O, equal to the squares C E and B K. We now have by simple geometrical construction defined an area similar to the ground plan of the Parthenon with four squares, one on each corner. To obtain the numerical value of the line N L we multiply the known line A N—*i.e.*, 111·341 by 1·4472. The result is 161·1326+ English feet. B L is 111·341 multiplied by 0·691 or 76·9366 English feet. Added, the two lines give us 238·0693, or the flank length of the ground plan. The square B J is 76·9366 by 76·9366. B C is equal to 76·9366, and C P 34·4044 or the difference between 76·9366 and 111·341.

We now have for the sides of the four squares at the four corners of the plan the numerical value of 34·4044 feet. We may now consider the centering of the columns, and at the same time define the error between Penrose's measurements and the plan.

Fourteen columns from a flank give us the following measurements from centre to centre.

13·983
14·052
14·124
14·110
14·079
14·093
14·058
14·094
14·066
14·089
14·113
14·068
14·124
14·084
————
197·137

Dividing this by 14, we have as a mean 14·081 feet.

The mean distance from the edge of the top step to the centre of the second column is 15·456 + feet. Multiplying this by two and adding 10 feet, the width of the steps, including the Euthynteria, multiplied by 2, we have 40·912 feet. This, added to 197·137, equals 238·049. The ratio measurement was 238·069. The error is 000·020—*i.e.*, two one-hundredths of a foot. It will be noted that the error by construction is always within the error of workmanship as we find it in the building. The mean distance from centre to centre of the columns is 14·081 feet. Penrose gives the distance from the edge of the top step to the cella wall in one case as 15·330, and in another as 15·350. The step width is 5·0; this added to 15·350 is equal to 20·350. If we consider the distance from centre to centre of the columns as the end of a rectangle, and the distance from the cella wall to the extremity of the Euthynteria as the side, such an area will be composed of a square plus a root-five rectangle—*i.e.*, the column centering widths, extending all around the building and excluding the angle columns and their immediate neighbors, with the distance from cella wall to step base, produce a series of areas similar to the generating area of the ground plan and directly connected with it by proportion.

14·081 × 1·4472 equals 20·378
Penrose's figures 20·350
———
Error 00·028

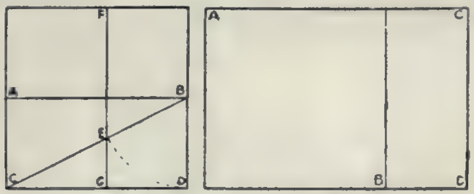
The greatest variations in the ground plan occur at the angle columns and their relation to their neighboring columns. This was probably due to the difficulty of making adjustments for refinements. In no case, however, is it much greater than an inch, a degree of accuracy difficult for others than practical architects to realize. From the centre of the second column to the top step the mean distance is 15·456 + step width 5·0, result 20·456; mean centre to centre distance 14·081, result 34·537.* Side of the root-five square on each corner, obtained from the generating scheme, 34·4044, error 0·1326. This approximate error probably was a factor in the increment of curvature in the stylobate. Asked once by the writer what he thought the increment of curvature or sagitta actually was, Penrose replied that it was difficult to say, though he had assumed it to be a definite amount in his book. He thought two to two and a half inches would be close enough.

We now must consider the subdividing of the corner squares to place the centering of the first and second columns in relation to the third columns. Sides of these squares pass through the centres of the third columns. Thus we have an arrangement of the subdivided area of a square as in Fig. 8.

---

* By construction we obtained 34.4044 for the side of this square. If we consider 20.350 plus 14.081, or 34.431, as the side of this square the error is reduced to 00.027.

A B is a square; A C, B C, two areas each composed of a square plus a root-five figure; E D, F C are squares. If A E be regarded as unity, then the areas F E or F D are composed of the square F C plus an area of a square and a root-five figure; that is to say, 1·691. The reciprocal of this ratio (it is one frequently found in other Greek designs) is 0·5913. The area B E or A D is composed of the square E D plus the square and root-five areas A C or B C, the ratio being 1·4472 plus 1·0 or 2·4472. The reciprocal of this is 0·4087. The reciprocal ratios 0·5913 plus 0·4087 equal unity or the line F B.



a Fig. 1. b

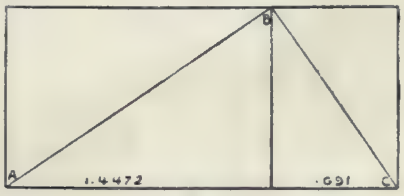
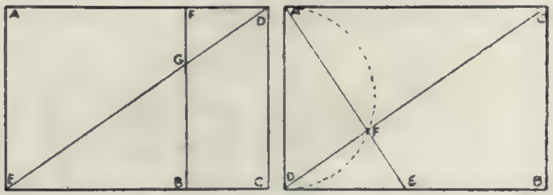


Fig. 2



a Fig. 3. b

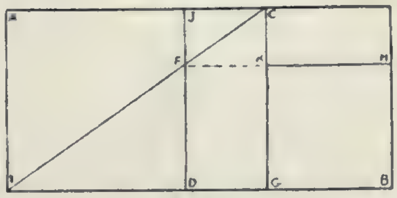


Fig. 4.

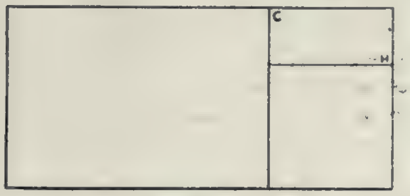
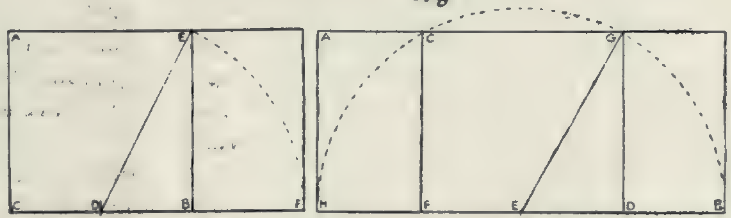


Fig. 5.



a Fig 6 b

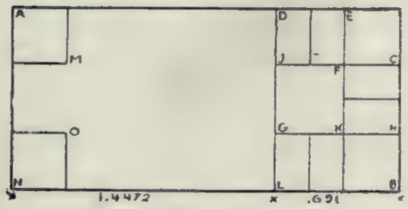


Fig. 7

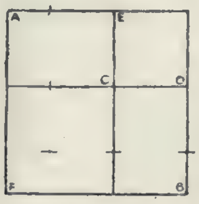


Fig. 8.

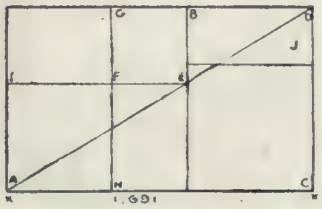


Fig. 9

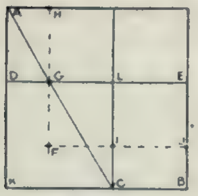


Fig. 10

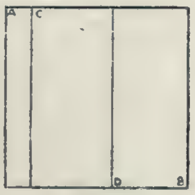


Fig. 11.

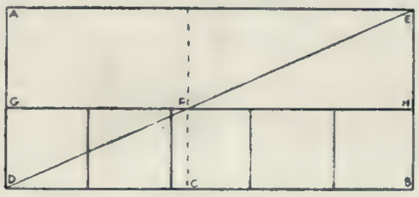


Fig. 12.

To construct within a square a square plus a square and a root-five rectangle: add a square and a root-five rectangle to a square. The ratio then will be 1·691, see Fig. 9.

A B is a square, B C a square, C E, plus the root-five rectangle J B. A D is a diagonal to the entire shape. A E is the area desired within the square A B. A F is a square within the area A E. A G is a similar shape to A E. G E is a square.

The centering of the columns in relation to the step width is done by a diagonal to the 1·691 area within the square on the corner of the plan as in Fig. 10.

A B is a corner square; A C a 1·691 area within it, and the diagonal A C of this shape cuts the line D E at G. This point G is the centre of the first column from the angle column F—*i.e.,* the area G C is similar to A C. The columns G and I are closer to the angle column F than they are to the columns H and J exactly as we find them in the plan. The width of the steps on the plan is fixed by constructing a root-five area within the 1·691 areas of the corners, Fig. 11.

A B is a corner square; A D a 1·691 area; C D a root-five area within A D; A C is the width of the steps.

Of course, the entire details of such a building as the Parthenon cannot be discussed within the limits of an evening's talk, especially when the subject itself has to be introduced. We must neglect the cella and the elevations with their details. It may be said, however, that the symmetry of all these conforms strictly to that of the ground plan. Moreover, the area arrangement we find in the Parthenon was not new to Phidias or Ictinus, close inspection of the symmetry of over a thousand examples of Greek design from the sixth century to the first century B.C. shows that the motif or theme found in the Parthenon appears many times in designs previously made.

It should also be remembered that analysis is not synthesis. It is often a perplexing matter to follow a cold trail, while the trail itself was easily and simply made. The evidence appears to indicate that these proportions of dynamic symmetry were the outcome of a method of surveying by area wherein a diagonal to two squares formed the base. The figures given above may be varied slightly and the errors reduced because it is not always clear what the exact measurements were. According to Penrose, the plan is not an exact rectangle—is any building plan exactly rectangular as it is carried out in the work? The stylobate on each front is 101·341 for one, and 101·361 for the other; the flank length on one side is 228.154 for one, and 228·141 for the other. If we take the double step width as 10·0, and use 111·361 for the end and 238·141 for the side of a rectangle, the ratio 2·1382 leaves an error of 3/100ths of a foot. Many confusing points of this character can only be cleared by another inspection of the building as it stands.

It may be added that the following ratios connected with 1·4472 and 0·691 appear in facades and details:—

Width of front, 111·341.

Height of facade by construction, 64·60+.

The lesser divided into the greater produces the ratio 1·7236. The fraction 0·7236 is equal to 1·4472 divided by 2. Penrose gives the average width and height of the triglyphs as 2·766 and 3·840. The lesser into the greater gives the ratio 1·382 (error 0·018). The reciprocal of 1·382 is 0·7236, or again 0·691 multiplied by 2. If the metopes were originally planned as squares, then metope plus triglyph is a similar figure to the facades, or 1·7236. The height of the angle columns, minus increment of curvature, is 34·250, the width of the abacus 0·685+; the lesser into the greater gives root twenty-five or 5 squares. The area factor which supplies all the details of the column head is root-five.

Root 25 equals 5·000
Root 5 equals 2·236
———
2·764 difference.

The difference 2·764 divided by 4 equals 0·691; or by 2 equals 1·382. The five squares of the angle columns are obtained by simple construction from a root-five area of the plan, see Fig. 12.

A B is a root-five rectangle; A C an "applied" square on the end. D E is a diagonal; it cuts a side of the square A C at F. D H is an area equal to the area of the square A C and is composed of five squares—*i.e.*, it is a root-twenty-five rectangle.

To those unfamiliar with the present method of analytical proof by arithmetic the process may seem complicated. It is, however, quite the reverse, as a little familiarity with the method will prove. Very early in his work the writer found that geometrical analysis was fallacious in every way; it invariably results in mere playing with lines and shapes. With it rigid proof is impossible. As the method by arithmetic now stands we may determine with great accuracy the symmetry of any design whatever without making a drawing. Diagrams and drawings are used to help the student visualize the facts and have nothing whatever to do with the proof.

The Use of Steel in House Construction

(*Continued from page 222.*)

erect, as every piece is carefully marked, so that with the aid of a corresponding plan no special skill is required in assembling the work. The erection of the steel frame enables the roof to be completed at the outset of the building operations, so that a large proportion of the remaining work may be carried out under cover. In the locality where most of the houses of this class have been built the steel framework has been severely tested for rigidity at all stages of construction by a continuous series of heavy gales, and the finished houses are found to be absolutely dry and stable under the worst conditions of weather.

To enable the reader to appreciate the results of the development of this new system, several interesting photographs are presented showing these houses in various stages of construction

1. Shows the steel framework for a pair of semi-detached parlor houses.

2. Shows the metal lath fixing in progress.

3. Pair of semi-detached parlor houses completed, the earlier stages of construction being shown in 1 and 2.

4. Type of parlor house with hipped ends to roof and with bay windows.

Three types of these houses, classed respectively as "A," "B," and "B4," have been approved by the Ministry of Health as standard types to be used freely in housing schemes.

The development is one which is undoubtedly not only of interest to Canadian architects and steel manufacturing firms, but it also suggests the possibilities of the use of steel framing for residential work other than the type of houses described.

CONSTRUCTION

A · JOURNAL · FOR · THE ARCHITECTURAL
ENGINEERING · AND · CONTRACTING
INTERESTS · OF · CANADA

H. GAGNIER, LIMITED, PUBLISHERS
Corner Richmond and Sheppard Streets.
TORONTO - - - - CANADA
M. B. TOUTLOFF, Editor

BRANCH OFFICES:

MONTREAL—171 St. James Street,
E. R. Milling, Representative.

WINNIPEG—336 Qu'Appelle Street,
F. C. Pickwell, Representative.

NEW YORK—505 Fifth Avenue.
H. M. Bradley, Representative.

CORRESPONDENCE.—All correspondence should be addressed to "CONSTRUCTION," Corner Richmond and Sheppard Streets, Toronto, Canada.

SUBSCRIPTIONS.—Canada and Great Britain, $3.00 per annum. United States, the Continent and all Postal Union countries, $4.00 per annum, in advance. Single copies, 50c.

ADVERTISEMENTS.—Changes of, or new advertisements must reach the Head Office not later than the twentieth of the month preceding publication to ensure insertion. Mailing date is on the tenth of each month. Advertising rates on application.

CONTRIBUTIONS.—The Editor will be glad to consider contributions dealing with matters of general interest to the readers of this Journal. When payment is desired, this fact should be stated. We are always glad to receive the loan of photographs and plans of interesting Canadian work. The originals will be carefully preserved and returned.

Entered as Second Class Matter in the Post Office at Toronto, Canada.

W. H. HEWITT, Business Manager

Vol. XIII Toronto, July, 1920 No. 7

Plans, Taxes and Small Houses

The matter of providing needed housing accommodations in the Province of Ontario is something which is up to the municipalities themselves. The Provincial Government grants the right to municipalities to issue their own bonds and to sell their debentures under a Government guarantee for housing purposes. Moreover legislation has recently been passed known as the "Municipal Tax Exemption Act," which, upon the assent of the rate payers, gives the council of any city, town, township or village the power to pass a by-law granting certain tax exemption upon building improvements. According to the Act this exemption for the first year that the by-law goes into effect is not to be less than 10 per cent. or more than 25 per cent. of the assessed value of the improvement, and from year to year thereafter, an additional percentage of such assessed value of not less than 10 per cent. or more than 25 per cent. is allowed under the Act until (a) the whole, or (b) such portion as may be fixed by the by-law of such assessed value is so exempted from taxation.

The legislation in theory follows the single tax principle; the object being to take a portion of the burden of taxation from improvements and add it to the taxation of land values. This should operate to stimulate building. But in going this far in the matter of municipal bonds and tax exemption to encourage developments, it would seem that it is necessary to go still further, particularly as regards the small house. The housing problem in Canada is anything but solved in its true economic sense. There is still the important factor of plan and design to be considered. The economic value of any building is not in fulfilling an immediate need, but in the influence it exerts in the community as a permanent asset. True, progress has been made under the Ontario Housing Act, and by private enterprise, in which architects have participated to a degree of establishing a desirable type of small house design, but this represents at the best merely a preliminary endeavor. The abovementioned legislation, which will undoubtedly give an impetus to the erection of small houses, also gives the architectural profession special opportunities to co-operate in such developments. A very practical plan whereby this could be accomplished was put forth recently by the Minneapolis Chapter at the fifty-third convention of the American Institute of Architects. According to the WESTERN ARCHITECT the initial feature of this plan is a bureau which all architects may join who wish to aid in the betterment of humanity and recognize some obligation to their profession and its advancement. Each member-architect agrees to prepare a set of plans and specifications for a small residence. This membership will be divided into regions, and regional directors elected, so that each locality may have direct supervision and prompt action. The bureau will be under a director, and the national headquarters will be in the Octagon at Washington. The bureau in each region will give advice in financing projects and in making contracts, and will act as is the architect's practice in large matters, the cost to the house builder to be nominal in the extreme. The benefits to be derived by the public through this movement inaugurated by the Minnesota Chapter cover a large field and range from the securing of a better type of houses, conveniently and compactly planned, to securing more lasting and durable houses with a consequent reduction of cost for repairs and the added financial values their construction will have on neighborhoods. The profession will gain in that the public will become more familiar with the value of architectural services and its carrying out is worth the serious and energetic work of the ablest in the profession.

In Canada a somewhat similar plan has been discussed relating to the small house problem, but as far as present knowledge goes, no definite action has been taken.

◆

Paris to Construct Homes for Workers

The municipality of Paris, a contemporary informs us, has taken in hand the housing problem there and proposes to spend 1,700,000,000 francs (nominally about $340,000,000) to solve it. It contemplates building 1476 new two-room workingmen's apartments at once, with 950 more to be erected later. They will be built in the heart of Paris and near the fortifications. It was stated that probably many half-finished houses being built for wealthy persons will be requisitioned by the municipality and turned over to workmen's families.

The shortage of housing facilities in Paris has raised a cry from many quarters, and to meet the situation many miniature "skyscrapers" have been built in Montmartre, much to the disgust of the artists who live there. They have formed a Parliament to discuss the question and have organized parties which take their names after the art school to which they belong. Thus there are the "Cubistes," the "Montmartrois," the "Sauvagistes," the "Dadaistes" and the "Gassieristes."

Some of the extremists are so enraged over the encroachment of the "skyscraper" builders into their district that they are urging all artists in the Montmartre to move to Marseilles.

◆

Dark Walls Waste Light

The color selected for walls and ceilings has a decided effect upon the lighting of rooms and upon our light bills. Even where the darker shades are used for artistic or other reasons, information as to the exact value of each color to reflect light is useful.

The illumination required in a room depends largely upon the amount of light absorbed by the walls and other surfaces. Dark surfaces absorb light, while light surfaces reflect a good proportion of the light back into a room. If the source of light is not changed, the effective illumination will vary with the reflection factors of the surfaces in the room. If, on the other hand, it is desired to maintain a fixed intensity of illumination, then the amount of light reflected by the walls on which the different colors are used will be in the following percentages of the light used: Enameloid, white, 80; flat tone, white, 79; flat tone, ivory white, 76; flat tone, cream, 71; enameloid, ivory, 64; flat tone, buff, 59; enameloid, pink, 51; flat tone, tan, 37; enameloid, tan, 27; enameloid, sky blue, 31; enameloid, cardinal red, 27; flat tone, forest green, 21; enameloid, wine, 12; enameloid, grass green, 10.—L. G. Denis, Conservatiôn.

◆

Building Steel Roofs by Electricity

One of the most important developments of electric welding in Great Britain lies in its application to building construction. The steel roof of a large factory recently erected in London was entirely welded, not a single rivet being employed. Each truss was completed on the ground, the various sections being merely laid in position and welded with mild steel by the arc process. When a truss was completed it was hoisted into position and welded on to the steel supports. The whole process of erection can be carried out much more quickly than when riveting is employed, and there is also a great saving in material.

◆

New Brick Making Plant in Northern Ontario

According to a recent news item a brick-making plant, representing a new industry in Northern Ontario, is to be established at Matheson by the Matheson Products Company. One hundred and ninety acres of land, with a clay deposit that is said to be 40 feet deep, will be utilized by the company which will manufacture brick, tile and terra cotta products. The plant will have a capacity of 20,000 bricks per day to start with, and the output is expected to increase to five times this amount in a short time. R. S. Potter is president of the company, and R. L. Ollman, manager.

◆

Moves to New Quarters

Mr. C. H. Acton Bond, architect, has removed his offices to Suite 20, No. 4 Wellington St. East, Toronto. Phone Main 1973.

◆

The Swedish Government, according to the Labor Gazette, is dealing with the house shortage, both directly by a state building programme providing for the erection of dwellings within the next five years to contain in all 40,000 rooms, and indirectly by building grants to local authorities, and through these to private persons, companies or societies. Builders will be required to raise capital to cover up to 50 per cent. of construction cost, apart from ground values. The state would grant a loan, secured by a mortgage, and valid for at least twenty years, for the remainder of the cost of building. These loans will be exempt from interest charges up to ten years, or in lieu of such exemption a further capital grant may be made up to 2 per cent. of the total cost. Similar building grants are also made to associations of civil servants.

CONSTRUCTION

August, 1920 Volume XIII., No. 8

CONTENTS

LEAVES FROM AN ARCHITECT'S SKETCH BOOK 235
By Charles Dolphin.

MEMORIAL FOUNTAIN, KEW GARDENS, TORONTO 246

R.A.I.C. COUNCIL MEETING 247

EXAMPLES OF RECENT HOUSE DESIGN 251

INSULATION OF CONCRETE WALLS 256
By Nolan D. Mitchell.

SURFACE-TREATED CONCRETE AND STUCCO 259
By J. C. Pearson, U.S. Bureau of Standards, and J. J. Earley, Sculptor, Washington, D.C.

SPECIMEN ADVERTISEMENTS, O.A.A. PUBLICITY CAMPAIGN 262

EDITORIAL 263
The London Convention—The Question of Publicity.

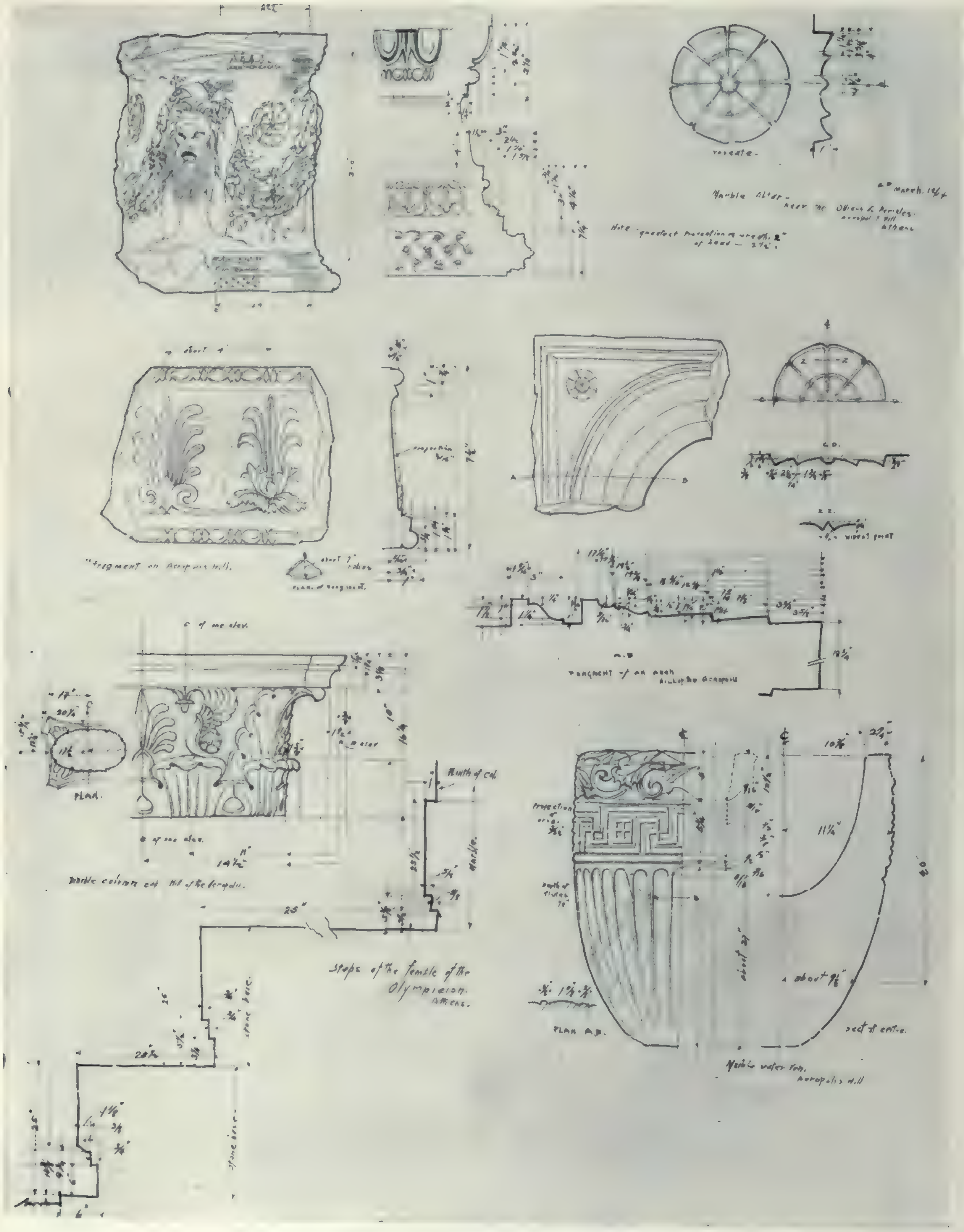
Full Page Illustrations

DETAILS OF FRAGMENTS, ACROPOLIS, ATHENS 234

SEAT OF CHIEF PRIEST, THEATRE OF BACCHUS, ACROPOLIS, ATHENS 236

DETAIL OF GARDEN FURNITURE, NAPLES, MUSEUM 240

H. GAGNIER, Limited, Publishers
GRAPHIC ARTS BLDG., TORONTO, CANADA
BRANCH OFFICES
MONTREAL NEW YORK


roseate.
Marble Altar – near the Odeion of Pericles. Acropolis Hill Athens
March. 1914
Note greatest projection of wreath 2" of head – 2½"
Fragment on Acropolis Hill.
projection
about 4'
Plan of fragment.
A–B
Fragment of an arch
Marble column cap Hill of the Acropolis.
PLAN.
Plinth of col.
Marble
stone base
Steps of the Temple of the Olympieion. Athens.
Projection of orn.
Depth of flutes
PLAN A.B.
about 9½"
Sect of centre.
about 21"
11¼"
Marble water font. Acropolis Hill

DETAILS OF FRAGMENTS, ACROPOLIS, ATHENS

DRAWN BY CHARLES DOLPHIN

Leaves From An Architect's Sketch Book

By Charles Dolphin.

This is the third and concluding instalment by Mr. Dolphin, giving his impressions of a study trip abroad, and deals particularly with Greece, Italy and Southern France. The sketches and measured drawings illustrated were made by the author at the time, and will undoubtedly prove of special interest to the reader, apart from Mr. Dolphin's general notes on his journey through the countries mentioned.—Editor.

IN the April issue of CONSTRUCTION this article on the architect or student abroad left me at Venice, and as it was my intention to visit Greece I had arranged my trip to sail from Venice, and after seeing Greece to land at the south of Italy and work north again until I returned to France.

An interesting thing about Venice is that there are no wharves at which the ocean liners tie up. The water being comparatively shallow the boats must stand well out in the channels and passengers must go out to their ship in gondolas amid much shouting and excitement. They never do anything quietly when they hurry in Italy. I nearly fell off the stairway trying to get aboard. How an old lady of 70 or 80 could make the trip is beyond me.

My proposed route was to Trieste, Austria, (now Italy), where I was to change to an Austro-Lloyd steamer to Patras, Greece, this being the most convenient way at the time. We left Venice early one foggy morning and the effect was quite fine as the sun struck through the mists and lighted up the colored sails of the lazy-looking fishing boats in the lagoons. We nearly cut a lumber barge in two that suddenly appeared dead ahead, and, as we passed, the end of her sail-boom grated down the side of our ship. I never saw an Italian show so much life in all the trip as our Captain and the crew of that barge. I don't know what they said but it was decidedly expressive and evidently quite to the point.

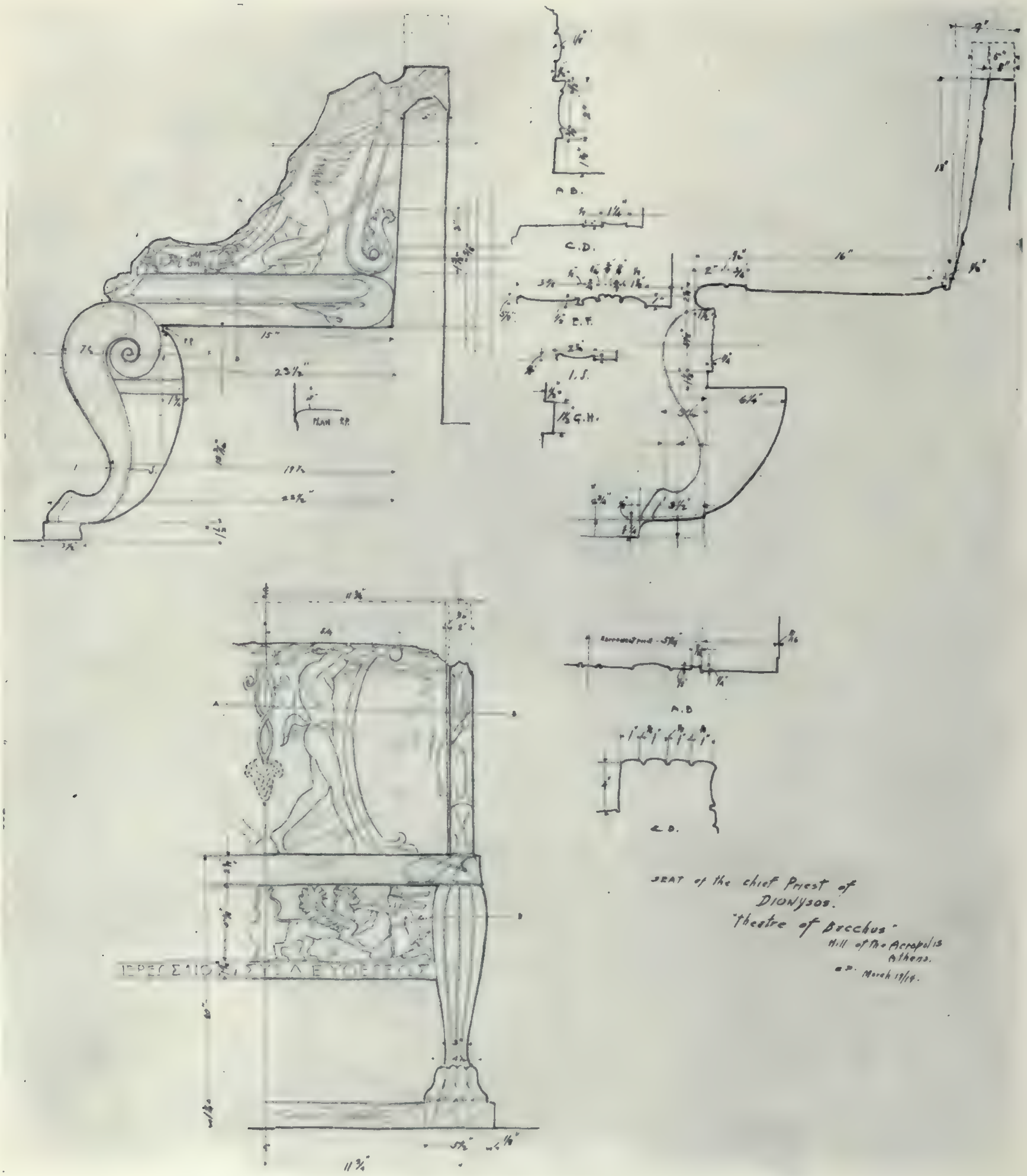
Arriving at Trieste, I spent the time between boats sightseeing, and had a look at the Austrian dreadnought, then building, that was blown up during the war, by that intrepid young Italian officer who ran his boat inside Trieste harbor.

TOWER OF THE WINDS, ATHENS.

As I wished to see Olympia I left the ship at Patras, Greece, and after a few enforced hours in that filthy goat-smelling town, I boarded the jolty little train for my destination. Olympia, the scene of the first and ancient Olympic games, gave me my first taste of Greek ruins and was worth all the aforementioned annoyances, i.e., goat's meat, goat smells, etc. Everything is goats in Greece and I should probably add, braying donkeys.

The Olympic ruins, though practically no complete buildings now stand, comprise so many beautiful remains of sculpture and foundations of ancient works, that a trip there should not be missed. It was never really a town, but a great grouping of temples, shrines, baths and places of sport and recreation, and consequently the ruins are practically all old and interesting. The museum contains priceless fragments, unearthed on the site. Very little is left of the original stadium.

From Olympia I returned to Patras via the railway, and thence along the coast via Corinth and across the great ship canal that connects the Gulf of Corinth with the Saronic Gulf.



SEAT OF CHIEF PRIEST, THEATRE OF BACCHUS, ACROPOLIS, ATHENS.

DRAWN BY CHARLES DOLPHIN

There are numerous places along the route from Patras to Athens where ruins and various points of interest may be found, but as time was a little pressing I proceeded directly to Athens. I might here pay tribute to Baedecker's Guide books—they are indispensable.

The views along the coast from Patras to Athens are magnificent. The sea is such a wonderful blue, with white sails dotted here and there, and the mountains on the northern shore form a splendid background.

Passing on through Piraeus (the seaport of Athens) I finally reached what has always seemed to me the birthplace of beautiful architecture, but as every student is more or less familiar with what Athens stands for, I will not attempt a minute description of its treasures, but merely impress upon the student to allow at least two weeks for study of the ruins, either by sketches, measured drawings, or photographs. There is such a multitude of beautiful examples of ancient work that one can find plenty of material for study and enjoyment. A point to remember is that very early morning and late afternoon are the best times to work, as the heat at midday is oppressive and very tiring.

MONUMENT OF LYSIKRATES, ATHENS.

A trip to the top of the Lyhabettos (Hill) should be made, as from here a very wonderful view of the city and surroundings can be obtained.

I stopped at a pension kept by a lady who was an aunt of the famous Will Sherring, the Canadian runner who won the Marathon race at the revived Olympic Games in 1906. Sherring lived at this pension and did his training over the Marathon course. The lady's name—if my memory serves me right—was Mrs. McTaggart, and her house is well recommended.

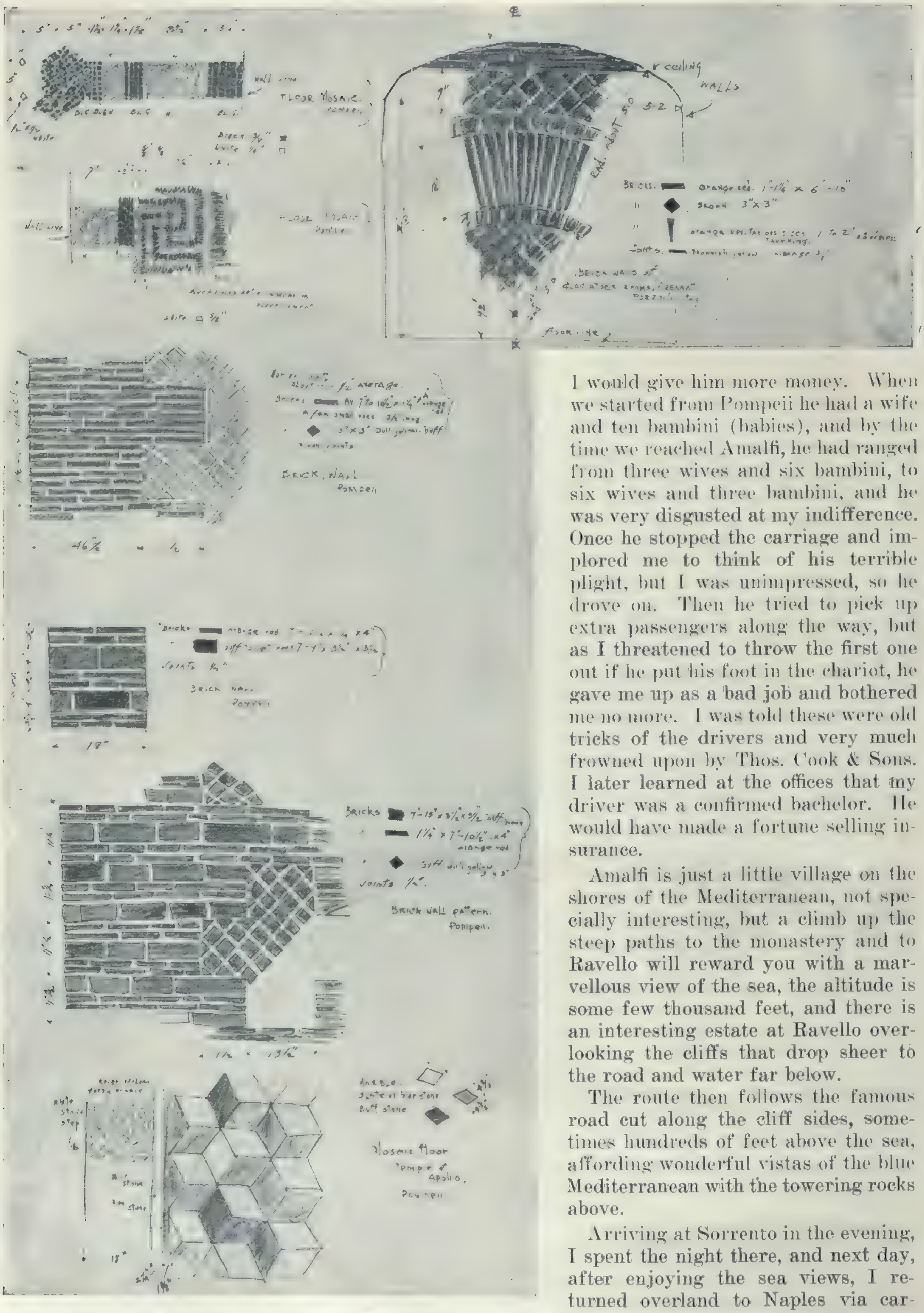
One of the many sights is the great marble stadium, the finishing point of the Marathon race. The stadium was entirely restored as in ancient times by a wealthy Greek of Alexandria, and is to-day the finest thing of its kind in existence, being entirely finished in Pentelic marble and seating about 50,000.

From Athens a trip to Constantinople is desirable, but as time was pressing I returned via Patras to Brindisi, South Italy, and from there by rail to Naples.

In Naples I found a very nice pension at the far end of the Marine Drive, and proceeded to explore the city, which though in itself is not rich in architectural objects, has at least a very wonderful museum containing collections from the unearthed Pompeii.

Through Thomas Cook's agency I arranged a trip by carriage (the usual method) to Pompeii, where I spent a day of sketching and measuring work. A day there is enough for an average view of the place, as it is smaller than the popular conception has it. Of course one might spend weeks working among the interesting ruins, but there is so much to cover that the average student cannot devote too much time to one place.

From Pompeii to Amalfi is a very interesting and delightful drive, and one which in my case proved amusing as well, because my driver, engaged and paid for at Thos. Cook & Sons in Naples, proceeded to lament on the hardness of his lot, hoping to invoke my sympathy so that



BRICK AND MOSAIC WORK, POMPEII.

DRAWN BY CHARLES DOLPHIN.

I would give him more money. When we started from Pompeii he had a wife and ten bambini (babies), and by the time we reached Amalfi, he had ranged from three wives and six bambini, to six wives and three bambini, and he was very disgusted at my indifference. Once he stopped the carriage and implored me to think of his terrible plight, but I was unimpressed, so he drove on. Then he tried to pick up extra passengers along the way, but as I threatened to throw the first one out if he put his foot in the chariot, he gave me up as a bad job and bothered me no more. I was told these were old tricks of the drivers and very much frowned upon by Thos. Cook & Sons. I later learned at the offices that my driver was a confirmed bachelor. He would have made a fortune selling insurance.

Amalfi is just a little village on the shores of the Mediterranean, not specially interesting, but a climb up the steep paths to the monastery and to Ravello will reward you with a marvellous view of the sea, the altitude is some few thousand feet, and there is an interesting estate at Ravello overlooking the cliffs that drop sheer to the road and water far below.

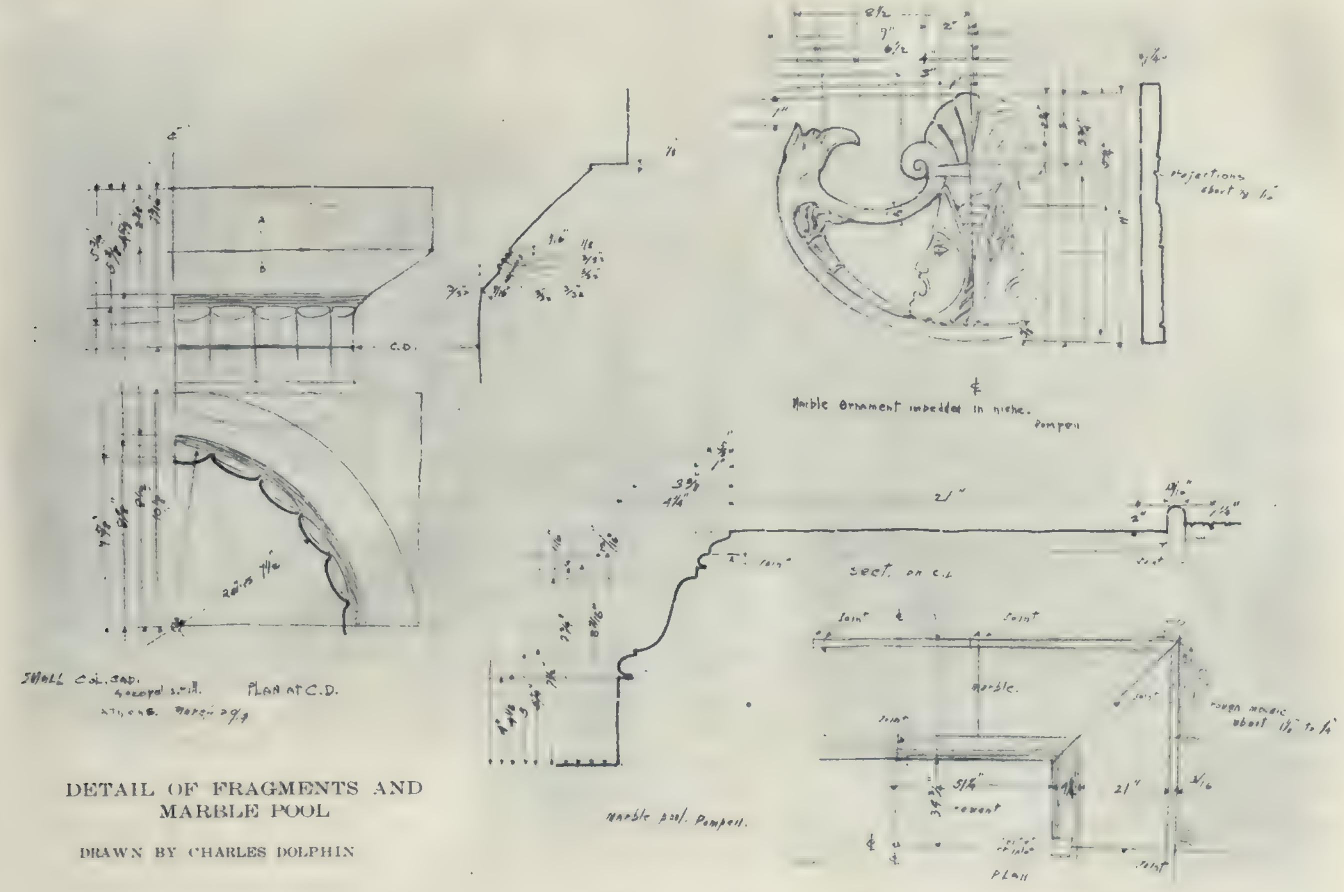
The route then follows the famous road cut along the cliff sides, sometimes hundreds of feet above the sea, affording wonderful vistas of the blue Mediterranean with the towering rocks above.

Arriving at Sorrento in the evening, I spent the night there, and next day, after enjoying the sea views, I returned overland to Naples via carriage route, accompanied by Ananias (for want of a better name) my driver.

I should have made reference to Mt.

Vesuvius, but as it was no architectural attraction, I contented myself with the view of it from Naples and Pompeii. The volcano is a very awe-inspiring sight at night, with its billowing pink clouds of steam and smoke, and the glare of the molten lava in the crater lighting up the sky; it is a beacon that can be seen for many miles.

After rambling about Naples for three or four days, during which I took a boat trip well worth while, to the Island of Capri, the home of coral cutting, and the famous Blue Grotto (natural sea cavern); I also went out to Pozzuoli, where there is a small volcano, where you can go down into the crater and walk along paths of hardened lava and poke sticks into the bubbling sulphur mass. I understand it is supposed to come from the lower regions, and after seeing that bubbling yellow sulphur, I decided to be a very good architect and lead a better life.



DETAIL OF FRAGMENTS AND MARBLE POOL

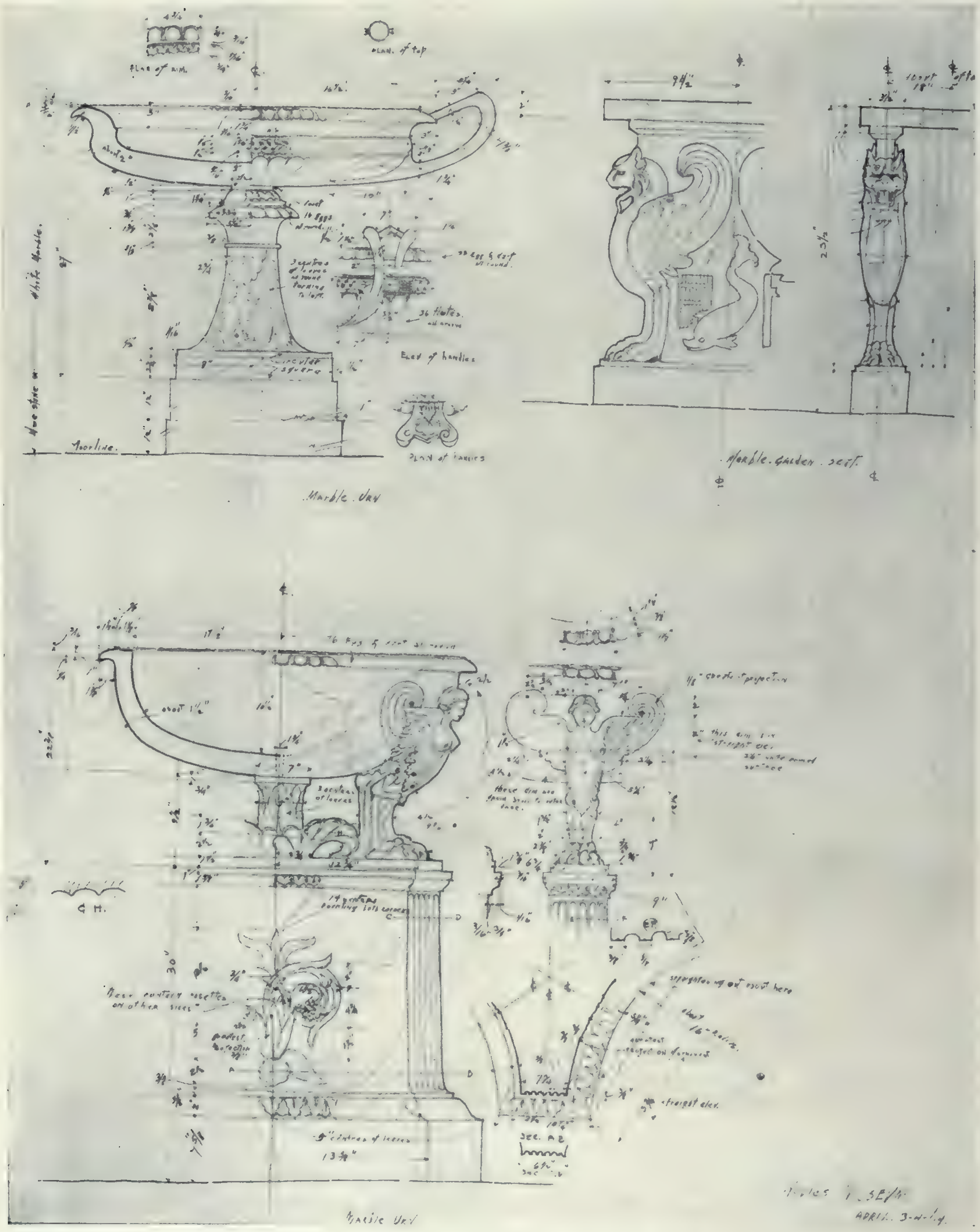
DRAWN BY CHARLES DOLPHIN

From Naples I went to Rome, and I might say that although I made it in one through journey, there are numerous places en route where one might stop off and find things of interest.

As I expected to do as much work as possible in Rome, I allowed three weeks for that place of places as I regard it, and by the way of advice to the student if he intends to work in the ruins of the Forum (most of the existing remains of ancient work lie close to the Forum) I would suggest that he locate at an hotel or pension nearby, hotels are the most expensive, as they give the advantage of saving time and energy in reaching the scene of work.

At the suggestion of student friends in Paris, I stayed at a pension on the Via San Basilio, near the Piazza Barberini, but found it too far from the Forum. I did a great deal of work in Rome and could possibly have accomplished more, had I not been a stranger to the city, and to save a possible follower of this article I would suggest, their picking out the most important points and devoting their best time to them. The following is a suggestion as to a few of the places one should not fail to see:

The Forum with its innumerable examples of what ancient Rome must have been. Nearby is the great Colosseum, so familiar to all, but none the less inspiring by its magnitude, for all that. The history of the Colosseum is a romance in itself, though a somewhat sinister one, and I experienced a creepy feeling as I stood in the arena and gazed round the towering banks of seats and thought of how it must have felt to be the poor prisoner, condemned to fight wild beasts. I believe they gave them a short sword to defend themselves with, but a short sword is a poor tool to work with when there is a hungry lion at the other end of it. It was here too that Nero had his human torches on poles around the arena as the games were in progress. Girls



DETAIL OF GARDEN FURNITURE, NAPLES MUSEUM.

DRAWN BY CHARLES DOLPHIN.

PONTE VECCHIO, FLORENCE, ITALY.

formed the torches, history tells us. The wonder of it all is how the Romans under such auspices ever produced such beautiful architecture.

The following is a short list of other points of great interest: Baths of Carracalla, Baths of Diocletian, Pantheon, Hadrian's Tomb, Palazzo Cancellaria, Massimi, Braschi, Doria, Farniese, and many others. Churches: St. Peters, Lateran, San Paulo Fiore le Mura's beautiful cloister, and a host of others scattered throughout the city. Rome has, I understand, more than 400 churches. Also Hadrian's Villa at Tivoli, and of course, the famous d'Este at Tivoli.

A trip to Viterbo where the famous "Black Hand" trial was held some years ago, made an enjoyable day's run by train from the city. It was at Viterbo that during the aforementioned trial, the prisoners, owing to the intense public agitation, were kept in a great steel cage in the court room during the proceedings. Viterbo contains a number of architectural points of interest worth the trip.

From Rome I proceeded by rail to Assisi, the birthplace of the Franciscon Order, founded by St. Francis. There is little of interest there, except the fine old church, and as it is nearly a mile from the station to the town, I was sorry in one sense that I left the train.

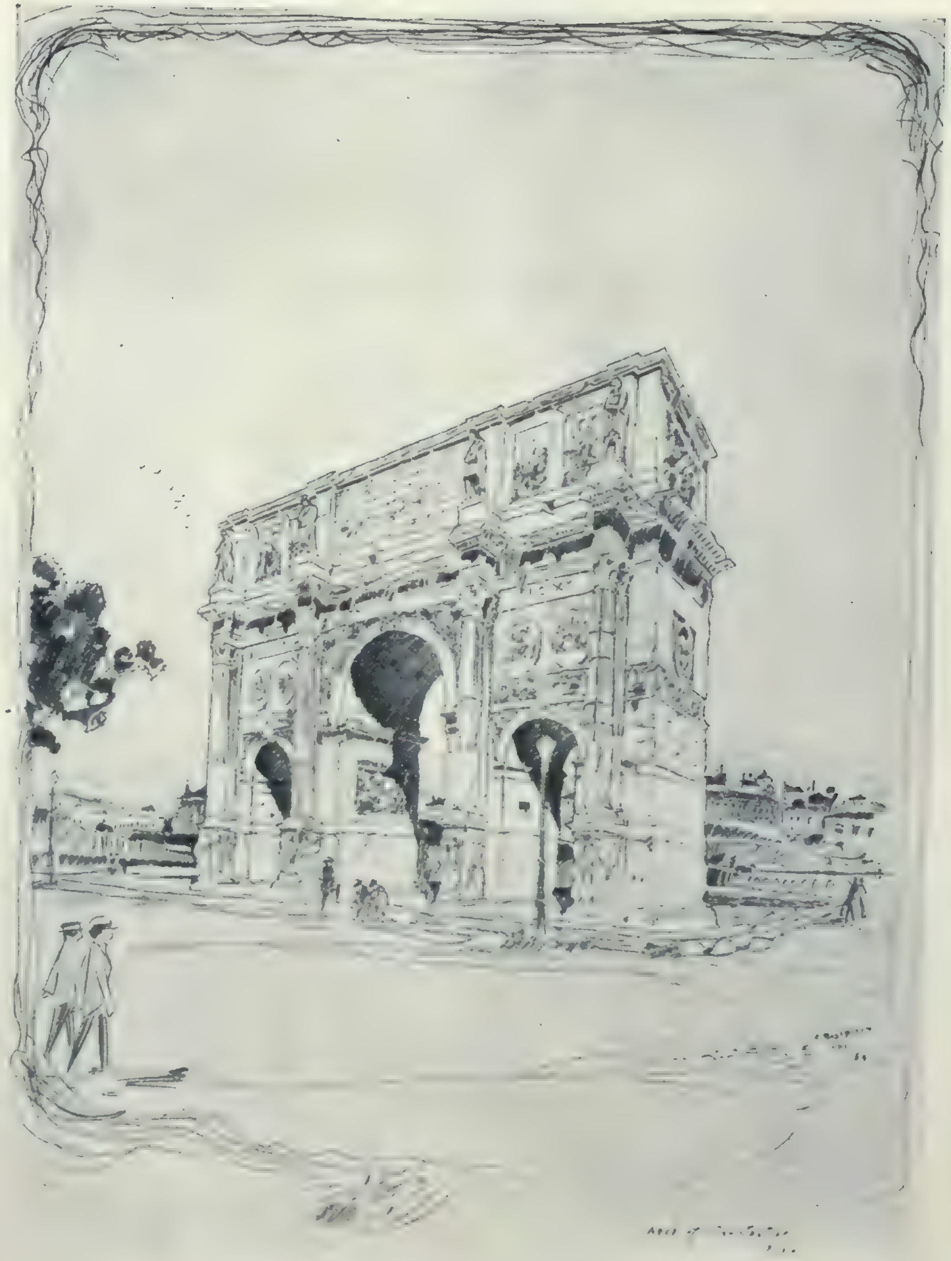
I then proceeded to Perugia, and was rewarded for the two days' stay. It is a mediæval town perched on top of a hill, commanding wonderful views and rich in architectural subjects.

Leaving Perugia I went directly to Florence. The route is very interesting and one gets fine views of all along the way, especially that part where the line skirts Lago (Lake) Trasemeno.

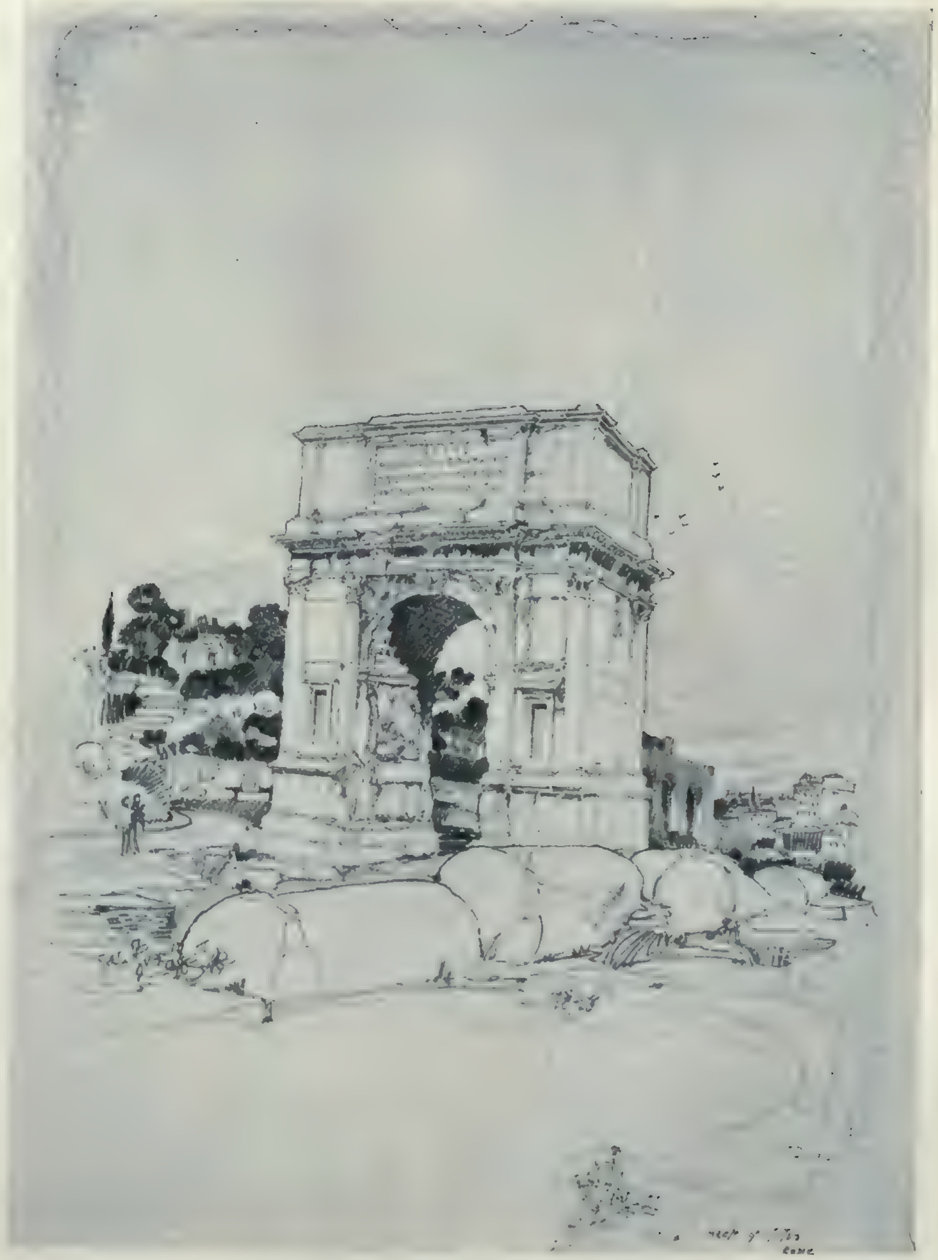
Florence, the City of Palazzos (palaces), is one of the best places of the whole trip, as it abounds in points of interest. I will not attempt to describe it in detail, but must mention one or two salient points about the city. Be sure to see the great Pitti Palace, built by a Florentine whose ambition was to have the greatest and most beautiful palace in the world, and he very nearly succeeded.

At least one week should be devoted to Florence, more if possible, as there is so much to see that it is a pity to rush through your work. It is also well to remember that the city is famous for its silver work and many interesting things may be bought for future home use at a comparatively low price.

One of the side trips from Florence is a run to Bologna. Though rather a long one it is well worth while, and two days at least should be devoted to it. One of Bologna's interesting



ARCH OF CONSTANTINE, ROME.



ARCH OF TITUS, ROME.

DRAWN BY CHARLES DOLPHIN.

features is the very fine arcade of streets, it being quite possible to travel over a great part of the town under cover of the buildings that are arched out over the sidewalks and supported on columns of very fine design.

Returning to Florence, I proceeded to Pisa, the city of "Leaning Tower" fame, but I should have mentioned that the rail journey to Bologna from Florence traverses the mountains of Central Italy and the views, as the train climbs into the mountains, are superb. I went to Pisa by way of Pistoia and Lucca, and though both those places have a number of points of interest, I did not stop over. Pisa will furnish material for a day's sketching, etc., and the leaning tower itself is very interesting, aside from its design. The fact that it remains erect at its present angle, is remarkable.

From Pisa I took the coast rail journey to Monte Carlo. The railway follows the sea along the cliff sides in many places, and at times travels in a niche cut in the rocky walls. We passed along the foot of the mountains from which the famous Carara marble is mined and a peculiar thing is that it seems to all come from the top of the mountains and the quarries are so extensive up there that waste marble chips have accumulated and slid down the mountains until they have the appearance of being covered with perpetual snow.

VILLA ADOLPHRANDINI, ROME.

Monte Carlo is practically barren of old architectural work, but the Marine Museum, founded and supplied by the Prince of Monaco, the greatest "deep-sea" explorer in the world probably, is well worth seeing. I am glad that some of the specimens that I saw live at the bottom of the ocean, it would certainly spoil one's whole day to meet them on the highway.

The Harbor, with its sea-going private yachts, presents a very striking appearance, and the dense blue appearance of the water is unforgettable.

At the Casino, where the gambling takes place (I did not play, for various reasons too numerous to mention), I saw one woman lose about $40,000 and I decided it was no place for an architect.

I then went on to Carcassone, France, via Marseilles, where I had to change trains. Carcassone is a mediæval town, practically restored to its ancient appearance by Violet Le Duc, and made an interesting day's visit—its walls and towers are very impressive.

From here I proceeded north through France taking in Lyon and Chartres, with its famous Cathedral, also Orleans, the home of Jean D'Arc. There is a number of houses of Francis Ist design here that are worth seeing.

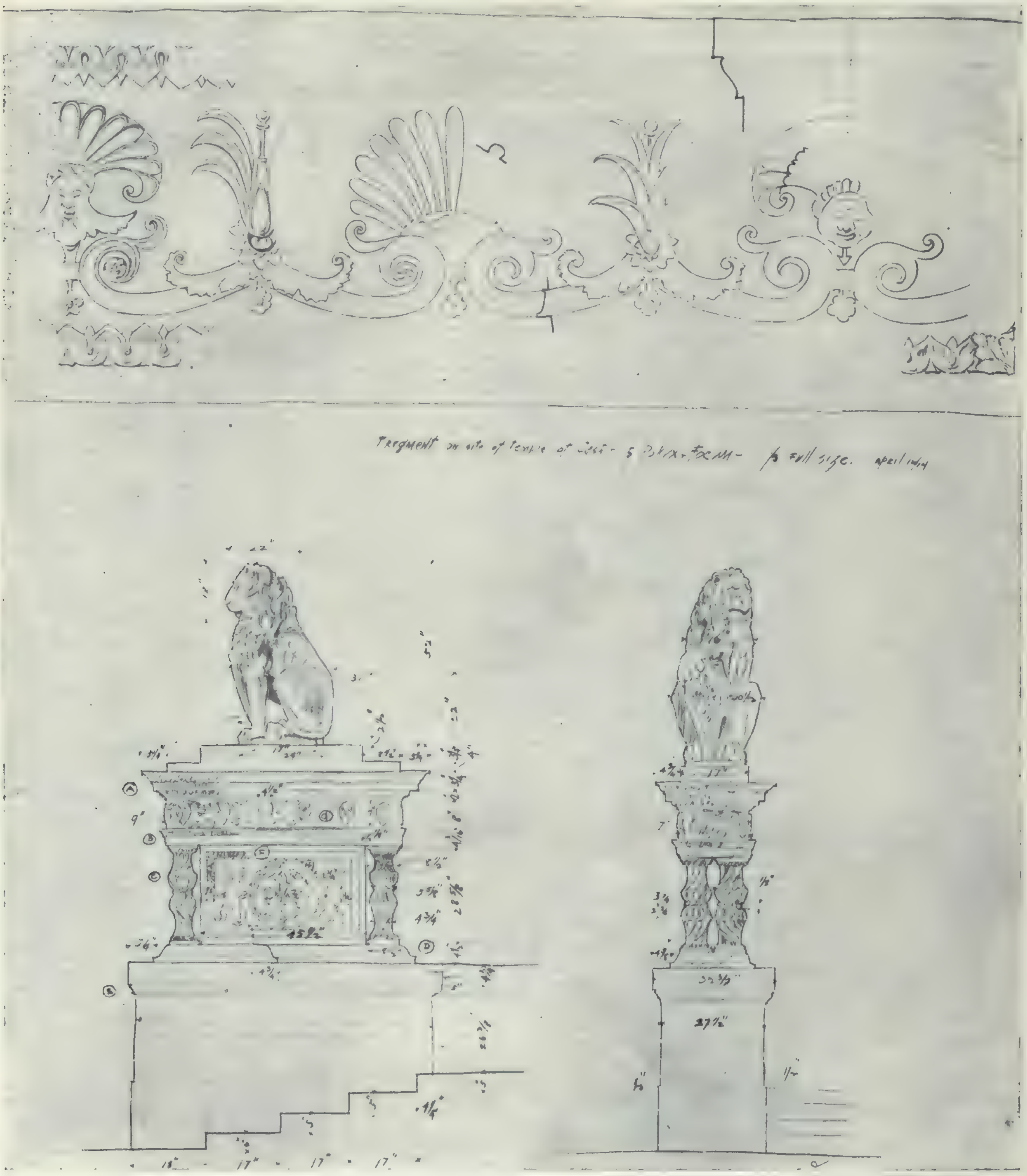
From Orleans, I followed the Loire Valley, taking in Tours, and the many Chateau towns on the way, such as Blois, Amboise, Chaumont and Chambord. The student should not fail to see these at least, and a good idea is to hire a bicycle (inexpensive) for the day, whenever possible.

It was in this Touraine District that Gambetta, who escaped from Paris in a balloon when the city was besieged by the Huns in 1870, landed, and formed his famous Army of Loire for the purpose of relieving Paris. Unfortunately, his army was beaten, and it remained for the present day to see his idea carried out. I little thought when there that I would be mixed up in an argument begun in 1870.

Arriving in Paris in June, I had the pleasure of seeing the city garbed in its spring foliage, both garden and human, and after the drab winter's colors, it was a welcome change.

After seeing St. Cloud, with its famous flower gardens, and completing all arrangements necessary for my return, I proceeded to Cherbourg and caught the American Line boat from Southampton, Cherbourg, to New York, returning from there to Montreal.

In the conclusion of this article I wish to repeat that it is written, not as a detailed description, from an historical point of view, or as a criticism, architecturally, of the various places visited, but rather in the hope of being of assistance to any who may be contemplating a similar trip to the Old World, if one may use the term. There was so much information that I could not get, such as a reasonable route to follow, that this article may be the happy medium of serving a much felt need to students or tourists in general.



MONUMENT BEFORE THE LOGGIA, FLORENCE.

DRAWN BY CHARLES DOLPHIN.

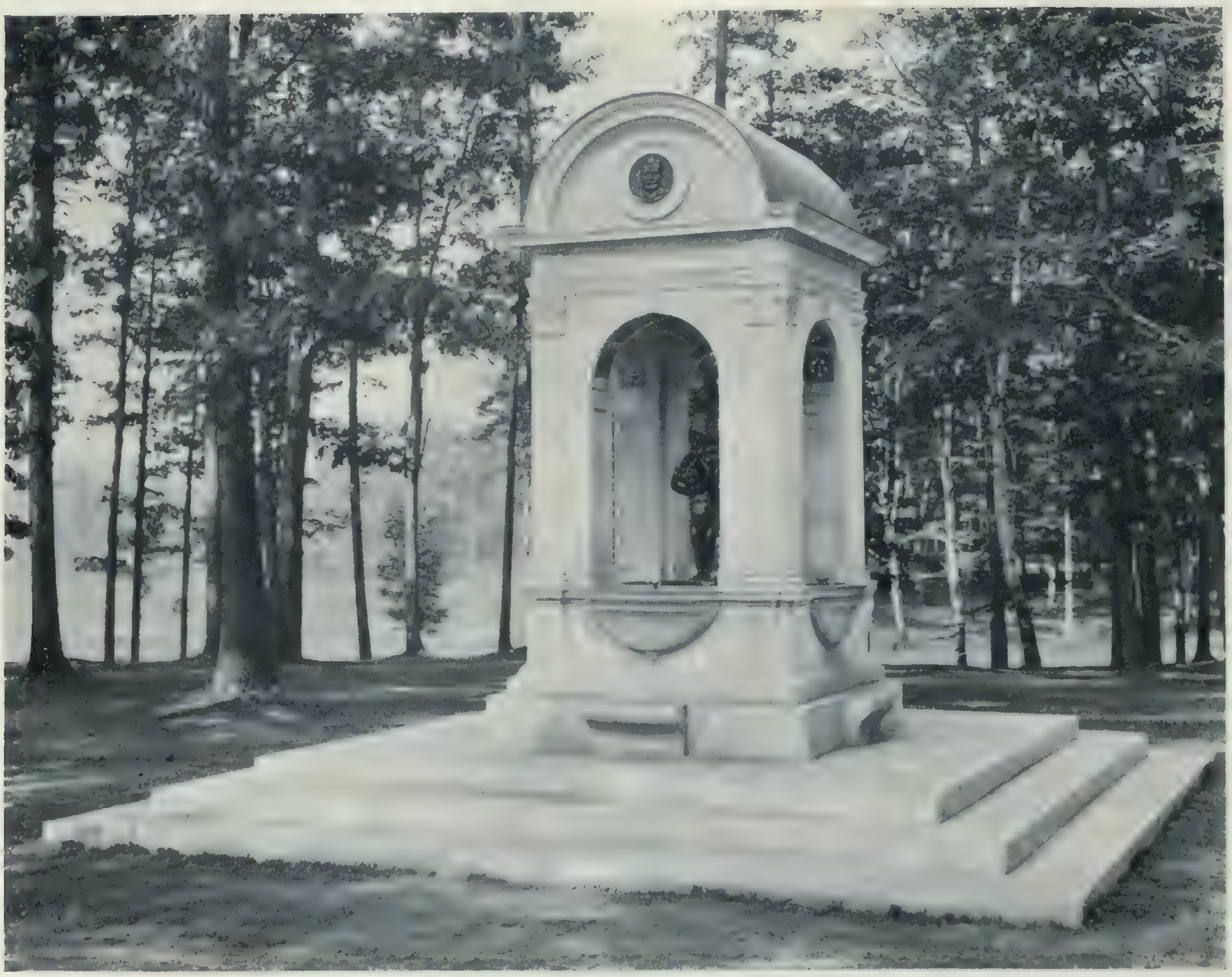
A Great British Harbor

Shortly before the war arrangements were made to complete the works at Fishguard Harbor, and these have now, in spite of many interruptions, been carried through. The northern breakwater, which is exposed to very heavy seas, has been strengthene dwith over three hundred tons of rubble (some of the masses weighing as much as three tons) and over 5,000 concrete blocks, most of which are of forty tons weight. The eastern breakwater has also been strengthened with more than eleven thousand tons of rubble. At the end of the northern breakwater a new concrete lighthouse has been erected, with a 5,000 candle-power lantern which is visible in clear weather for a distance of thirteen miles. Its mechanism—revolving the optic, ringing the fog-bell, and supplying the gas—is electrically controlled from the generating station at the root of the breakwater. The end of the eastern breakwater carries an automatic flashing light using dissolved acetylene gas. The supply of gas to the burner is automatically controlled by a "sun valve," which turns the gas on at sunset or at an yother time when daylight becomes inadequate for safe navigation. The gas cylinders contain enough for a whole year's supply; and for ten months this mechanism has been working satisfactorily without any attention. Fishguard Harbor was begun in 1898, and represents a triumph of British engineering over serious natural obstacles.

CHATEAU DE CHAUMONT, FRANCE.

Better Than Casting

The good that comes out of evil is illustrated by the fact that during the recent moulders' strike in Great Britain many engineering firms, unable to obtain castings, were stimulated to develop alternative methods of producing the parts they required. One large firm, for example, was in urgent need of large pipes, and it set to work to build up pipes of the required shape from steel plates by welding together suitably-formed pieces. Excellent results were obtained even with complicated shapes, the surface being as smooth as a fine casting. The expense proved to be much about the same as casting, but in the case of special work the labor and material involved in making patterns (which might never be used again) were saved.



THE DR. YOUNG MEMORIAL FOUNTAIN, KEW GARDENS, TORONTO.

MAURICE D. KLEIN, ARCHITECT.

Memorial Fountain, Kew Gardens, Toronto

The memorial erected at Kew Gardens, Toronto, to the late Dr. D. W. Young, was made the occasion of a befitting ceremony on Civic Holiday when it was unveiled in the presence of Mayor Church and a large gathering of prominent east end citizens. The memorial, which is a gift to the city, takes the form of a drinking fountain designed in the Renaissance style, and beautifully situated in a wooded section of the park. The monument itself is about 5 ft. 6 in. square and rests on a fountain about 18 ft. square. The drinking fountains are located three feet from the edge of the platform and above same on all sides are open arches giving a vista through the park. The soffit of these arches are carved, five pateras to each arch, on a blue colored background, the pateras being in gold.

At the centre of the monument is a figure of a child in bronze holding a shell over its head from which water is playing and which is emblematic of the many acts of kindness and benevolence which characterized Dr. Young's life. On each side of the archways are pilasters running to the underside of the architrave. These are of a modified Corinthian order and fluted, being carried on consols. Indeed a result has been achieved which does credit to Mr. Maurice D. Klein, the designer, and those associated with him in the work. Above the cornice is a semi-circular roof covered with copper. On the east and west sides are bronze medallions of Dr. Young, while the freize on its four sides bears the following alternate inscriptions: "Service was his aim" and "Friend of the needy." A bronze plate inset in the floor of the platform on the east side also contains the following wording, "In grateful memory of William D. Young, B.A., M.D., whose services to the residents of this district were characterized by a spirit of devotion, self-sacrifice and true philanthropy."

The mouldings and detail of the stone work are very beautifully done. The models of the ornament and carving were executed by Edward

(*Continued on page* 249.)

R. A. I. C. Council Meeting

A MEETING of the Council of the Royal Architectural Institute of Canada was held July 10th at the office of the Institute, 590 Union Avenue, Montreal. Those present were: President A. Frank Wickson (Chairman), David R. Brown, Chas. S. Cobb, J. M. Watt, H. E. Moore, Jos. Perrault and Alcide Chausse, Hon. Secretary.

The meeting resolved itself into a morning session at the above address followed by a luncheon at the Royal St. Lawrence Yacht Club at Dorval, Que., and an afternoon meeting on board the official yacht of the club on Lake St. Louis.

Following the reading of the minutes of the last meeting of the Council held at Ottawa on February 7th, which were approved, the Council took up the following items:

R.A.I.C. Medal.—In reference to the R.A.I.C. Medal, Mr. David R. Brown reported that he had communicated with the Bromesgrove Guild about this subject and that a design for the medal had been prepared, but was not altogether what the Council desired. It was moved and carried that a special committee composed of Messrs. David R. Brown and Chas. S. Cobb be appointed with full power to act in this matter.

Architectural Institute of British Columbia.—A letter received from Mr. S. M. Eveleigh was read referring to the recent bill passed by the Provincial Legislature granting incorporation to the Architectural Institute of British Columbia, a copy of the bill of incorporation being enclosed with Mr. Eveleigh's communication. It was resolved to request the President to convey the compliments of the R.A.I.C. Council to the British Columbia Institute in this connection.

Remission of Dues of R.I.B.A. Members.—The Hon. Secretary reported that according to the by-laws of the Royal Institute of British Architects, the Royal Institute shall each year contribute to any non-Metropolitan Allied Society not more than one-fourth of the annual subscription paid to the Royal Institute by each member thereof who is a member of such society, in respect of and for his subscription thereto, but in no event shall such contribution apply in the case of any one member to more than one allied society.

The Hon. Secretary further stated that it was impossible for him to prepare such list, as the members of the provincial associations, who are *ipso facto* members of the Royal Architectural Institute of Canada, do not always mention the fact that they are also members of the Royal Institute of British Architects, or that they are in good standing with that body.

It was suggested that arrangements be made with the R.I.B.A. to the effect that the R.I.B.A. refund to members of the R.A.I.C. one-fourth of their annual subscription, when said members give evidence that they are in good standing with the Canadian Provincial Association to which they belong, and the Royal Architectural Institute of Canada.

The President agreed to communicate with Mr. F. S. Baker, Hon. Secretary, R.I.B.A., for Canada, in order to come to some understanding in the matter.

Alberta Association of Architects' Dues.—The President reported that as decided at the last meeting of the Council he has been in communication with the Alberta Association, and a settlement of past dues of the *pro rata* contributions has been made to date.

Saskatchewan Association of Architects.—It was suggested that the President make arrangements with the Saskatchewan Association of Architects, respecting past due *pro rata* contributions, on the same lines as the settlement made with the Alberta Association of Architects.

War and Battlefield Memorials.—Regarding the question of memorials, the President read a letter from Hon. Geo. E. Foster, at the time acting Prime Minister of Canada, to the effect that the report which appeared in the press announcing that a commission for proposed War Memorials had been awarded to Old Country architects was not correct. The President will follow this matter closely.

The Secretary was further requested to write to W. B. Northrop, Clerk of the House, Ottawa, for a copy of the "Battlefield Memorials Report of Special Committee, 4th Session, 13th Parliament, 1920, No. 1984-1."

In reference to the Post War Committee on Architectural Practice, Mr. David R. Brown stated that the work of this committee had not been completed and that there was nothing definite to report to the meeting.

Mr. Chas. S. Cobb submitted the result of his trip to Ottawa to interview the authorities regarding the important matter of duties on plans, and reported progress.

COMMUNICATIONS.

R.I.B.A. Committee on Unification and Registration.—The Secretary read a communication from the Royal Institute of British Architects to the effect that their Council has formed a committee representative of the whole of the profession in England to consider and report upon the question of unification and registration. Every architectural organization of any standing in England, the letter states, is appointing delegates, and there will also be representatives of architects unattached to professional organizations. The R.I.B.A. Council has provisionally appointed Mr. Andrew T. Taylor (retired F.R.I.B.A.) to represent the Dominion of Canada, subject to the approval of the Canadian Institute, or the wishes of the R.I.A.C. should the Canadian Institute prefer to nominate another representative.

On motion of Mr. Joseph Perrault, seconded by Mr. David R. Brown, the Council voted to endorse the above appointment.

The Rome Scholarship Competitions.—The Council also received the Scheme of Competition for the Rome Scholarship regarding the subjects of Architecture, Sculpture, Decorative Painting and Engraving, offered by the Commissioners of the Exhibition of 1851; and for the Henry Jarvis Studentship, offered by the Royal Institute of British Architects.

It was found that the competition for architecture is open and confined solely to students and associates of the R.I.B.A., while the other competitions are open to any British subject.

The Secretary was requested to write to the Honorary General Secretary of the British School at Rome, 1 Lowther Gardens, London, S.W. 7, England, and to ask if students and associates of allied associations would in reference to the competition in architecture be considered on equal footing with the students and associates of the R.I.B.A.; also as to whether it would be possible to hold "en loge" examinations in Canada under the supervision of the R.A.I.C.

British Columbia Technical Association.—A communication dated May 28th last, from the British Columbia Technical Association, was read suggesting the formation of similar organizations throughout Canada.

It was decided to send a copy of the communication to the Provincial Association asking for an expression of opinion regarding this matter before September 30th next.

Nationality of Members.—A letter from Mr. Geo. W. Northwood, chairman of a special committee of the Manitoba Association of Architects, asked information as to how the matter of nationality of members of architectural associations is dealt with in other parts of Canada and the United States. In Manitoba an amendment has been proposed to the effect that "All members must be British subjects by birth or naturalization."

In this connection the Hon. Secretary drew attention to the following clause in the recent Act of Incorporation of the Architectural Institute of British Columbia:

> Section 24 (b).—An architect seeking registration under this Act, who is a citizen of a foreign country or state, shall be admitted to practice architecture in this Province on passing such examination as may be prescribed by the Council; Provided that such foreign country or state of which he is a citizen recognizes the standards of qualification set out herein on an equal footing with its own, and admits the members of this Institute equally with their own citizens; and provided also that the applicant shall have been engaged in the continuous study or practice of architecture for a period of not less than eight (8) years in the said country or state prior to his application for registration hereunder.

The Council fully approved of the principle set forth in the above clause, and requested the Secretary to bring this provision of the British Columbia Act to Mr. Northwood's attention.

Campaign of Publicity.—Another communication from the Manitoba Association of Architects dealt with the matter of advertising, in connection with which it was resolved by the Council that the correspondence be referred to the several provincial associations with the request that each of the associations contribute for a campaign of publicity, and asking them the amount they would be inclined to subscribe, the publicity to be proportioned to the amount subscribed by each province.

Association of Canadian Building and Construction Industries.—Consideration was also given to a letter from the Association of Canadian Building and Construction Industries dated May 27th, asking (a) that "lump sum" contracts be strongly discouraged until existing conditions become normal and that the "cost plus percentage" or "cost plus a fixed or sliding fee" form of contract be advocated; and (b) suggesting the formation of a committee consisting of four members of the A.C.B. and I. and two representatives each from the Engineering Institute of Canada and the R.I.B.A., to cooperate in drawing up a standard form of contract, sub-contract and general conditions, which could be used throughout the Dominion.

It was moved by Mr. David R. Brown, seconded by Mr. Alcide Chausse, and carried: that Messrs. Jos. Perrault and J. M. Watt be requested to act on the special committee which the A.C.B. and I. recommends.

Proposed National Electric Code.—The Canadian Engineering Standards Association, Room 112 West Block, Ottawa, asked the advice of the Council regarding the desirability of obtaining an expression of opinion from the various provincial architectural associations in the establishment of a Canadian National Electric Code, having reference to both fire and life hazards, and with a view to the appointment of a small committee to make a preliminary report regarding the matter.

In the discussion it was pointed out that at present the matter of electrical inspection is in the hands of the fire insurance companies identified with the Canadian Underwriters' Association, and that American standards are enforced; also that all electric lighting material bear the label of the Chicago laboratory. The question was raised as to whether in the event of a Canadian code being drafted, it would be a copy of the American regulation, and if it would, as is now the case, be necessary to have these materials and fixtures tested by an American laboratory.

It was resolved by the Council that it would be desirable before such a national code was adopted in this country, to consult the Canadian Underwriters' Association and the Canadian Manufacturers' Association. While the R.A.I.C. quite favored such a code, it was also felt that it would be desirable to establish a Canadian laboratory for the proper testing and inspection of electrical materials.

Licentiates R.I.B.A.—The Council's attention was drawn to the fact that under the provisions of the Charter and By-laws of the R.I.B.A. the last date on which a Licentiate can be nominated for the Fellowship is December 31st, 1920, and that any Licentiate R.I.B.A. who desires to be promoted to the Fellowship should take the necessary steps at an early date and communicate with Mr. Ian MacAllister, Secretary R.I.B.A., 9 Conduit Street, London, England.

Further communications before the meeting were:

A letter from Mr. I. Gorman, Lic. R.I.B.A., Alor Star, Kedah, Malay States, asking information about his brother Joseph Browne Dick Gorman, Lic. R.I.B.A., who up to a couple of years ago resided at 184 Laurier Avenue West, Montreal.

Letters from Mr. William E. Woolley, M.S.A., M.C.L., F.I. San. E., 118 Queen's Road, Walthampton, London, England, giving information about (a) The Committee of Distribution of Architectural Work, Belgium; and (b) the National Congress of Belgian Architects.

An announcement of the formation of the Society of Technical Agriculturists, of which Mr. Fred. H. Grindley, University Club, Ottawa, is Secretary-Treasurer.

And an announcement advising the Council of the opening of a professional School of Architecture at Princeton, N.J., U.S.A.

Progress was also reported by Mr. David R. Brown in reference to correspondence with the American Institute of Architects on the question of competitions.

While members of the R.I.B.A. were in attendance at the meeting of the Dominion Fire Prevention Association at Ottawa on May 12th and 13th last, no report has been submitted.

Montreal Offices of the R.A.I.C.—The Hon. Secretary reported that as authorized by the Council at its last meeting, the special committee composed of Mr. David R. Brown and himself, have rented from the Province of Quebec Association of Architects, offices for the Institute at 590 Union Avenue, Montreal, at an annual rental of two hundred dollars, and that the effects of the Institute had been moved from Beaver Hall Square to the above quarters.

FINANCIAL.

The financial report showed a balance in the bank to the credit of the Institute of $926.34, and on motion by Mr. Alcide Chausse, seconded by Mr. H. E. Moore, the Hon. Treasurer was authorized to liquidate current accounts.

NEXT GENERAL ANNUAL ASSEMBLY.

It was moved by Mr. H. E. Moore, seconded by Mr. David R. Brown, and carried, that the Thirteenth General Annual Assembly of Institute be held at Ottawa, on October 1st and 2nd next, and that Messrs. W. D. Cromarty and C. P. Meredith, with the President and Hon. Secretary, be appointed to form the Committee of Arrangement for the Assembly.

Both at the noonday luncheon at the St. Lawrence Yacht Club and on the trip on the "Dorval," the members of the Council were the guests of Mr. Jos. Perrault. The cruise on the "Dorval" not only enabled the members of the Council to transact all unfinished business under most enjoyable auspices, but also gave them the opportunity of witnessing at Beaurepaire, Que., at the conclusion of the afternoon session, one of the best yacht races held on Lake St. Louis this season. After the races the members left the "Dorval" at Beaconsfield, Que., where they were the guests of Mr. David R. Brown at the Club House of the Beaconsfield Golf Club of which Mr. Brown is President.

This mingling of business and pleasure resulted altogether in one of the most successful executive meetings yet held, as is evidenced by the large number of important items of business transacted.

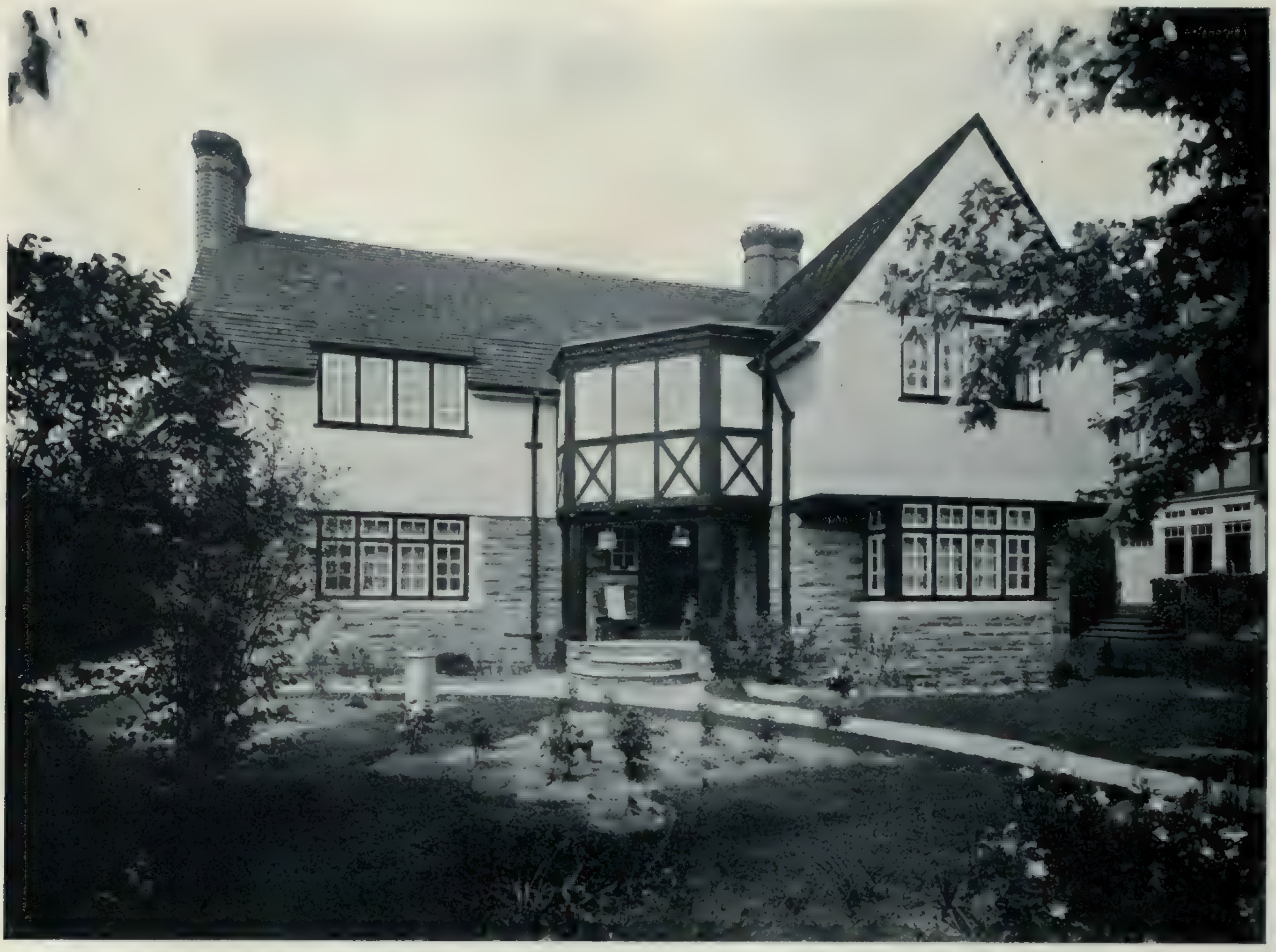
At the conclusion of the day the visiting members of the Council from Quebec City, Toronto, and London, Ont., extended an unanimous vote of thanks to Messrs. Jos. Perrault and David R. Brown for the royal way in which they were entertained.

◆

Memorial Fountain, Kew Gardens, Toronto

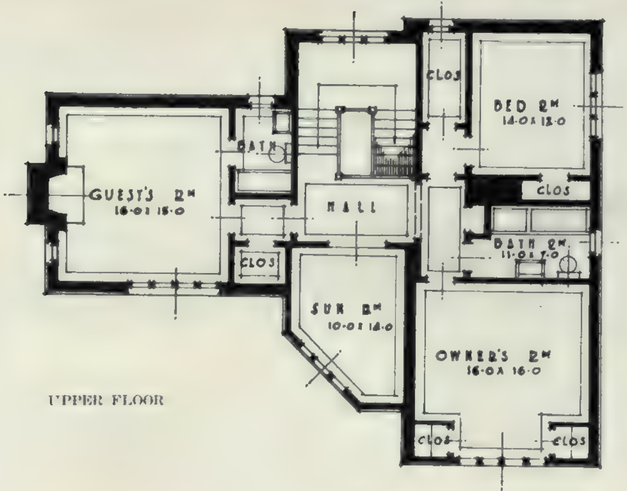
(*Continued from page 246.*)

Watson and speaks for the quality of this artist's work. The bronze figure of the child is also a noteworthy piece of sculpture, the work of Miss Florence Wylie of Toronto, as is likewise the bronze head which is a remarkable likeness of the late physician modelled from a photograph by Mr. Ivor Lewis.

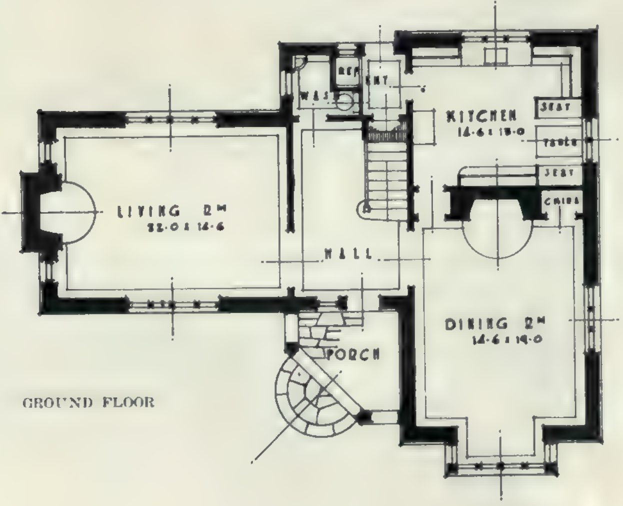


HOUSE OF MRS. C. C. E. MALLOCH, TORONTO.

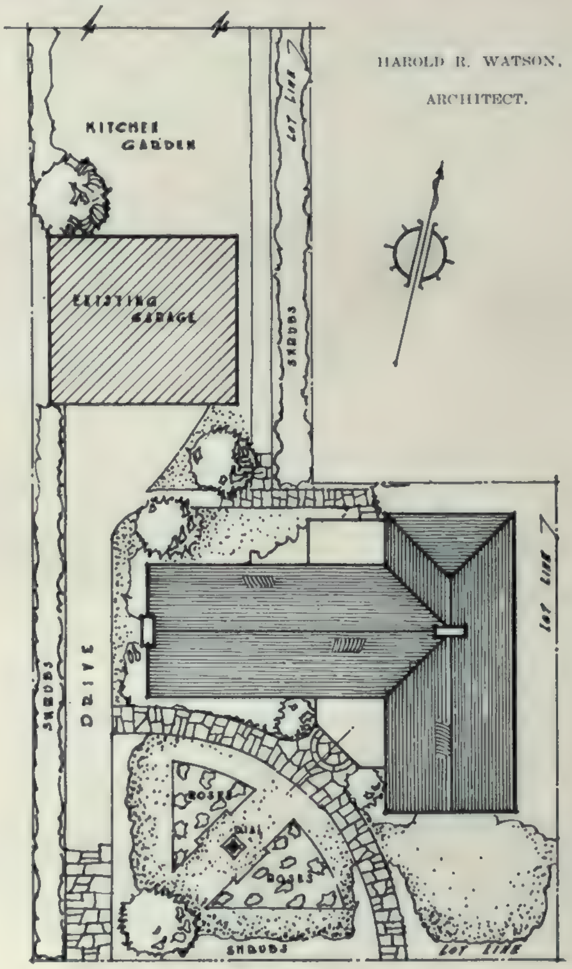
HAROLD R. WATSON,
ARCHITECT.



UPPER FLOOR



GROUND FLOOR

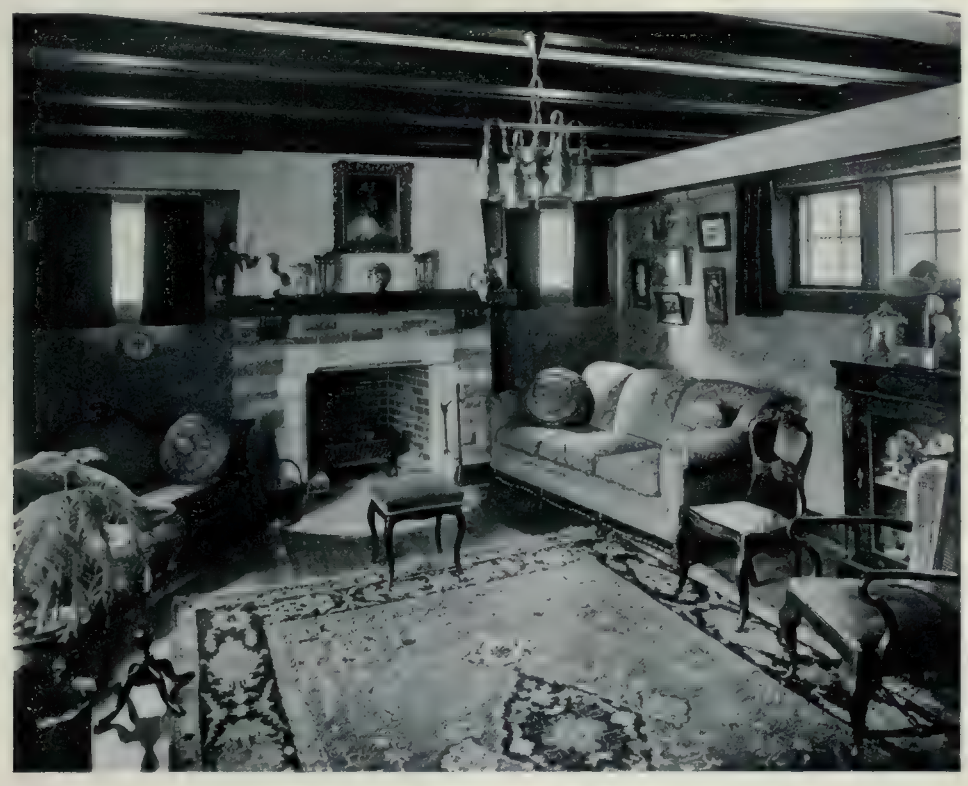


PLOT PLAN

Examples of Recent House Design

IN the accompanying views are presented several recent residences representing the work of Mr. Harold R. Watson, Toronto, including three individual houses and one group development, all of which show a careful study of the domestic problem.

The plot plan of the Malloch house shows a rather interesting solution to an irregular site, having very little depth and more or less controlled by an existing garage building, which has ultimately formed a very pleasing composition with the house itself. The principal aspect is to the south, where the scheme is carried out with an informal treatment of a rose garden with sun dial, shrubs and flag walk. In addition to this, there is a kitchen garden of approximately a hundred feet in depth, located behind the garage.



LIVING ROOM, MALLOCH HOUSE, TORONTO.

The layout of the house shows the tendency of the times to provide a minimum number of rooms of generous proportion, which may be administered without much dependence upon help. With this end in view the kitchen has been designed to embody every facility conducive to the ease of housekeeping, and the introduction of a small breakfast alcove forms a very pleasing feature of this room. The finish is in white enamelled pine with black hardware. It is also conveniently located as regards service entrance and kitchen garden.

The living room is of simple design, with rubble stone fireplace having Indiana limestone mouldings. The principal aspect of this room is to the south overlooking the rose court. It is finished in quartered white oak with deep recesses to the windows, made possible by the thickness of the stone walls.

The dining room, which is panelled in quartered white oak up to a height of the window heads, is of the Tudor style, with an Indiana limestone fireplace. Over the fireplace a space is provided for a mural painting. The ceiling is slightly relieved with a plaster moulding.

The main entrance hall is also finished with quartered white oak, with a simple treatment of the hand rail. The front porch floor is red quarry tile of about eight inches square.

The upper floor plan shows a self-contained guest's apartment, owner's bedroom, small sunroom and third bedroom, and the large linen press completes a rather compact layout. The rooms here are all finished in pine, white enamelled, and are very nicely decorated throughout. The owner has not only used excellent discretion in the selection of the papers used, but has given the architect every assistance in working out the scheme.

A few features worthy of note are in the half-timbered porch and sunroom, which is of adzed white pine held together with oak pins. In fact, all window frames are constructed in this manner. The stone used is laid in Scottish rubble masonry of local limestone, and the color effect obtained by placing 20 per cent. pure grey with

DINING ROOM, MALLOCH HOUSE, TORONTO.

about 80 per cent. pink or piebald stone. All openings are dressed with Indiana limestone.

THE NEWELL RESIDENCE.

The Newell residence is situated on the south side of Whitney Avenue, and is on a more or less regular lot of about sixty-foot frontage. It again calls for a house which can be administered with a more or less independence of household help, and is of a simple Colonial character in both plan and elevation.

A feature of note in plan is the sunroom at the rear of living room, overlooking the garden, and which has been so placed as to be of easy service from the kitchen in event of this room being used as a breakfast room. The interior finish is white oak floors and trim on the ground floor, and pine with an enamelled finish on the first floor.

Red quarry tile is used for the front terrace which is carried out with a pergola treatment and central entrance porch. The ends of this pergola are provided with built-in seats. The color of the shutters is of dull green-grey, which together with the natural finished plaster walls makes a very pleasing setting with the surrounding foliage.

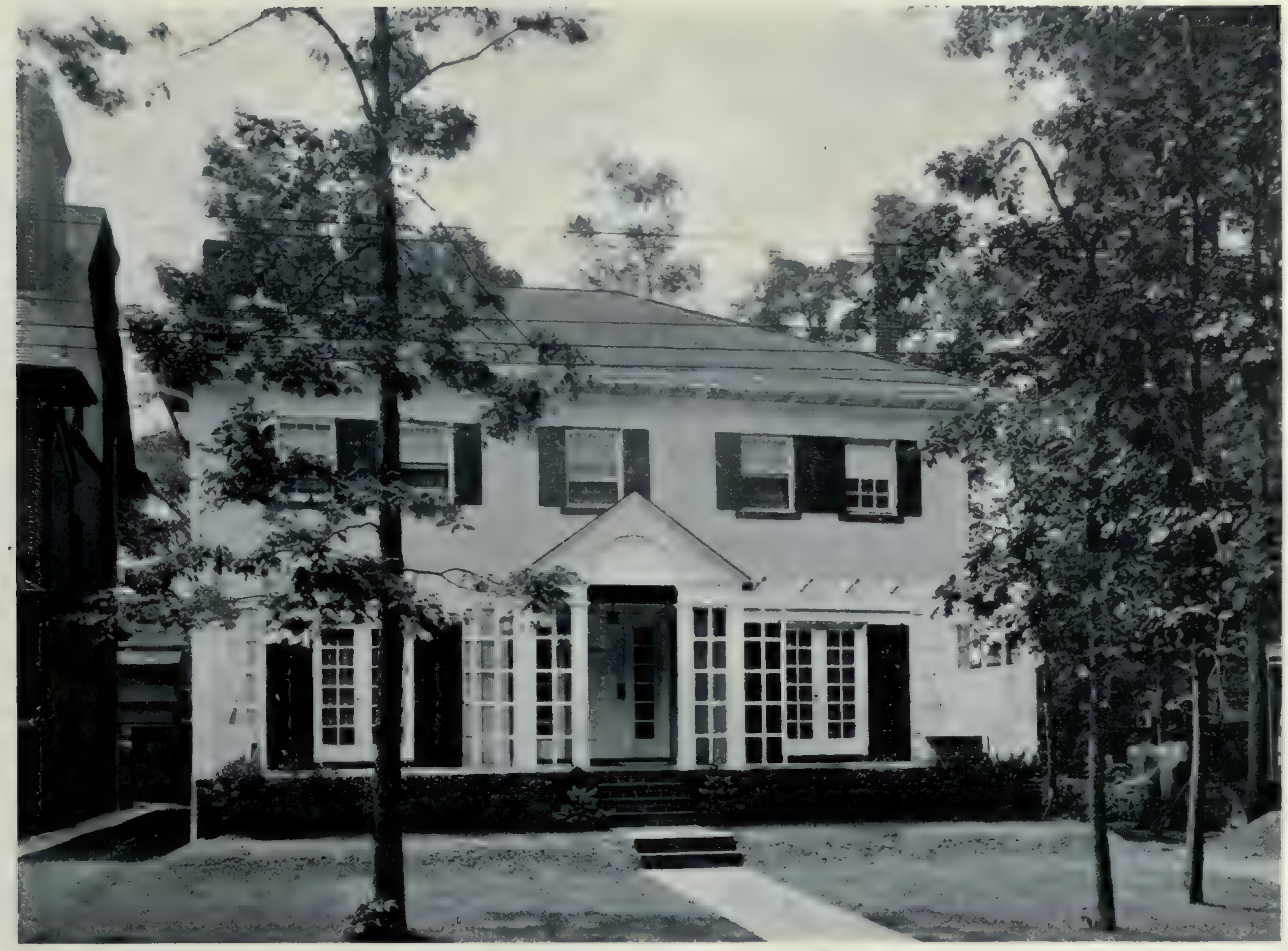
THE BOOTH RESIDENCE.

This house is on a seventy-foot lot facing the west, which is quite regular in shape and for that reason necessitated no particular treatment. The lot is beautifully wooded with oaks which were preserved to a great extent at the request of the owner.

The conservatory in this house is also arranged that it might be used as a breakfast room if so desired, and the general problem has been handled with a view to a minimum of domestic labor. Chestnut trim with oak floors, is used for the lower rooms, and white enamelled pine upstairs. The basement contains a billiard room, with wash adjoining same.

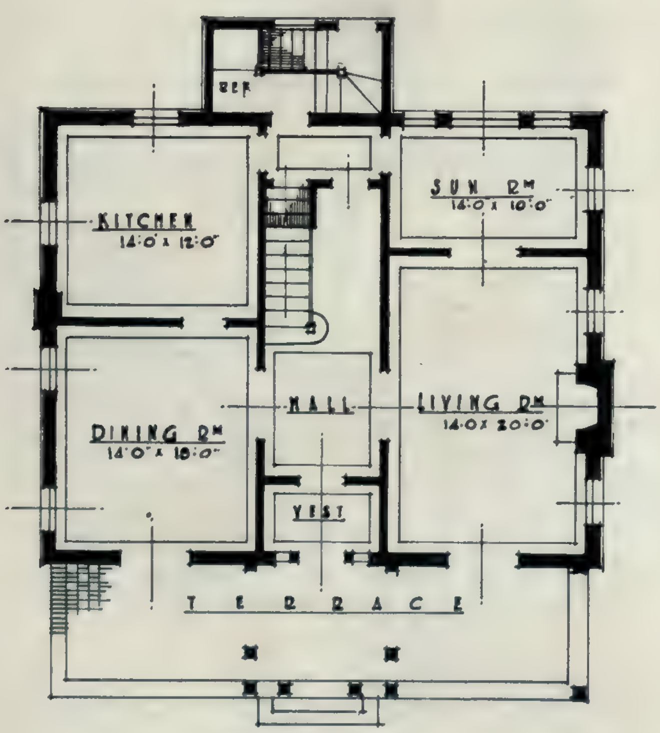
The lower storey is of Credit Valley limestone, laid at random, and is an excellent example of stone masonry. The openings throughout are all treated with Indiana limestone and the frames are all adzed pine, held together with oak dowels.

BEDROOM, MALLOCH HOUSE, TORONTO.

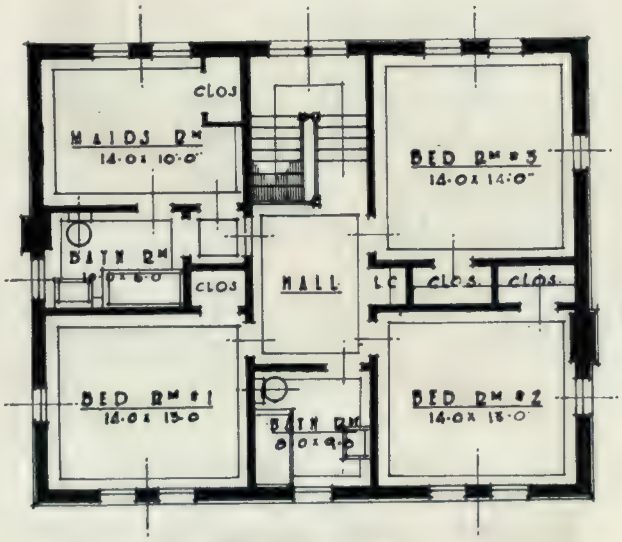


HOUSE OF EDWARD NEWELL, ESQ., TORONTO.

HAROLD R. WATSON, ARCHITECT.



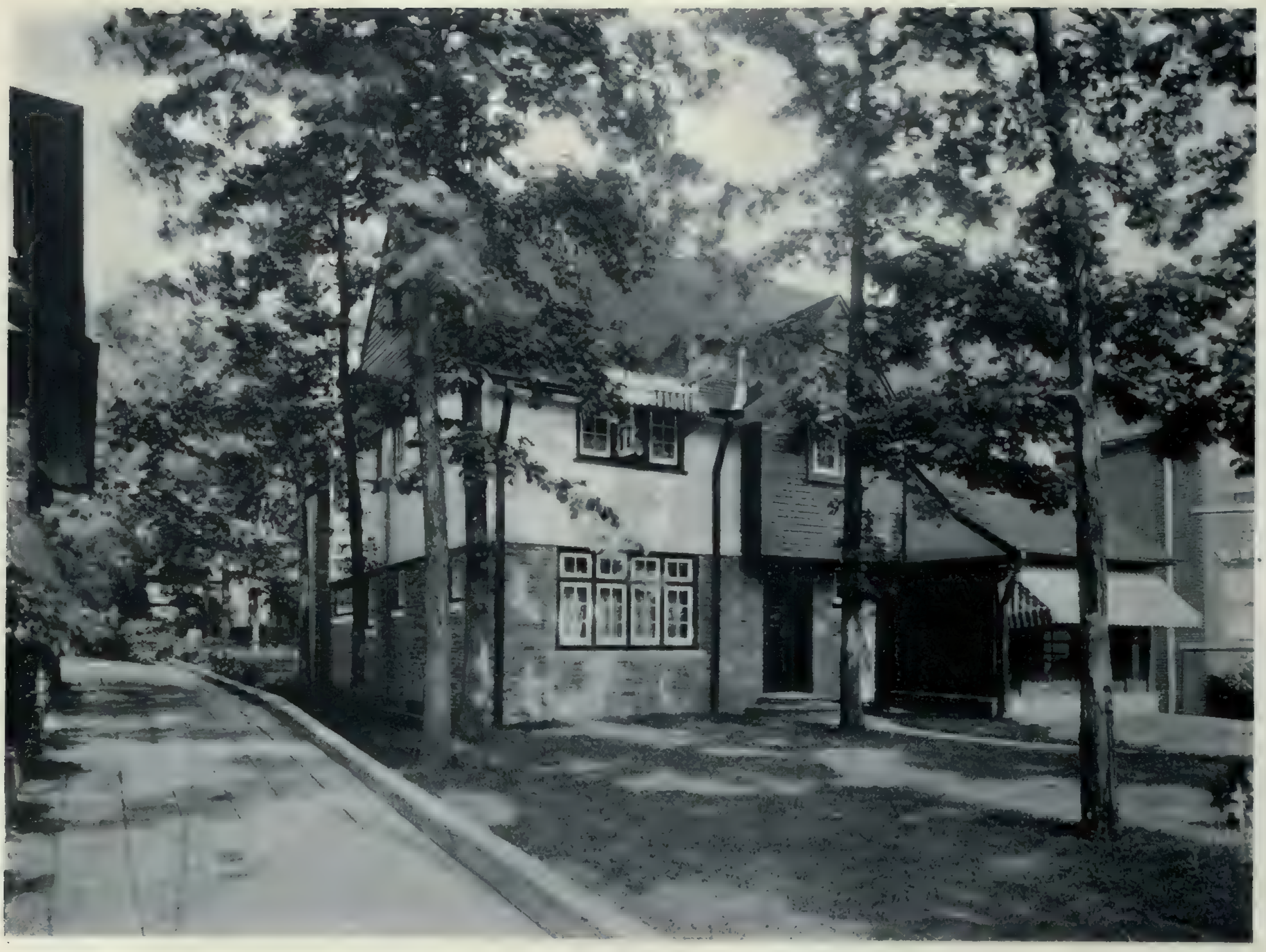
GROUND FLOOR PLAN



UPPER FLOOR PLAN

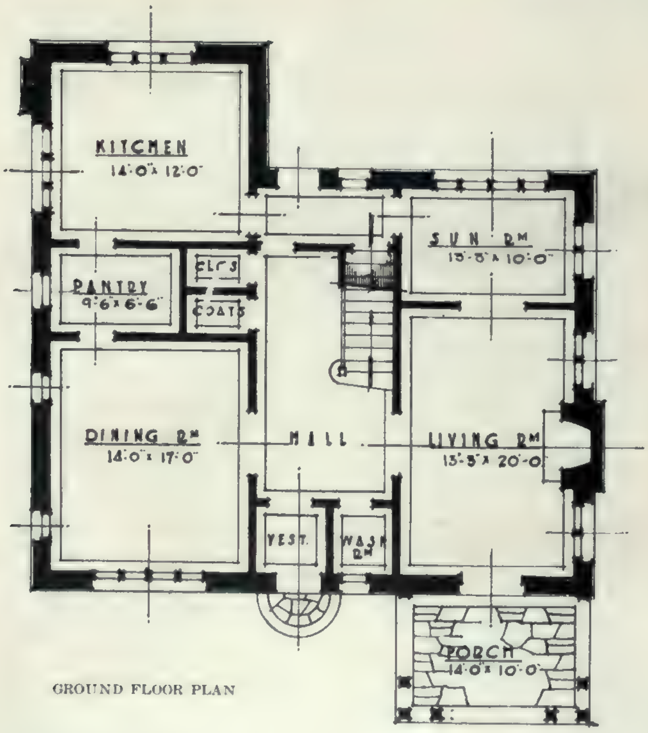
LYNDHURST AVENUE DEVELOPMENT.

As the houses in this development are not quite complete, it is somewhat difficult to give photographically an idea of the effect that the landscape work will have in a few years' time. The problem presented was that of placing four houses on a piece of land of very limited dimensions. It was felt by the architect that three houses would have been much more appropriate on the site. However, the plot plan shows an interesting solution of the problem, as well as the possibilities of a proper architectural and

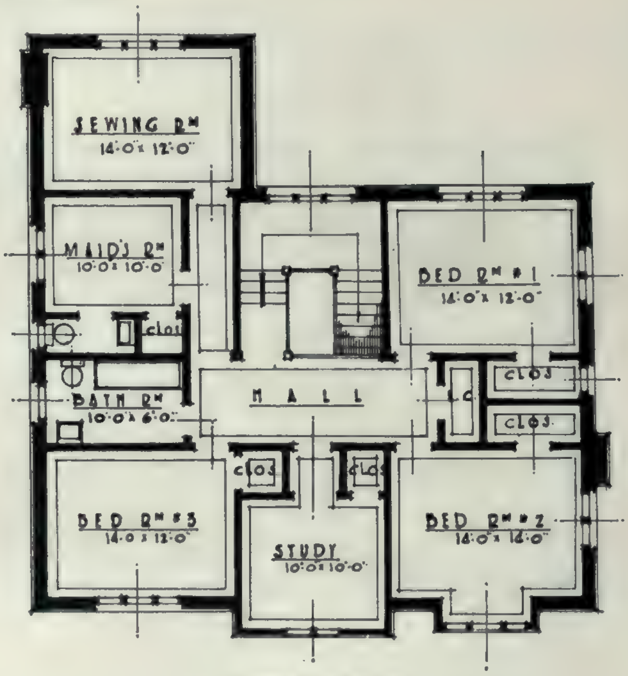


HOUSE OF A. E. BOOTHE, ESQ., TORONTO.

HAROLD R. WATSON, ARCHITECT.



GROUND FLOOR PLAN

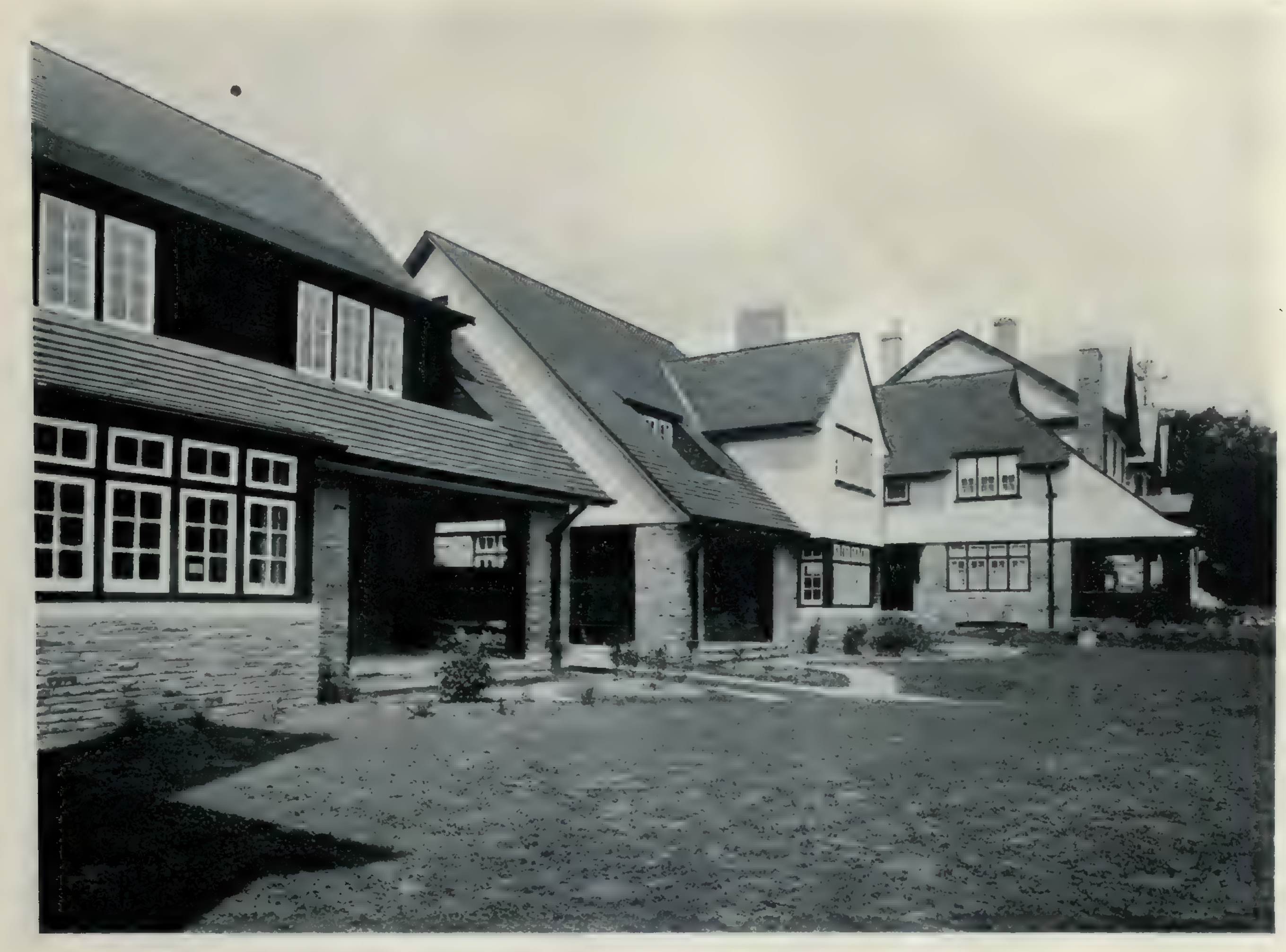


UPPER FLOOR PLAN

landscape grouping in connection with domestic architecture.

The houses are all constructed of Credit Valley limestone laid at random with half-timbered work and frames constructed of hand-adzed pine, held together with oak dowels. The walks and drives are flagstone and form a happy contrast to the cold effect of concrete.

An interesting feature of the grouping is the fact that the north house in this development was so turned as to break away from the ex-



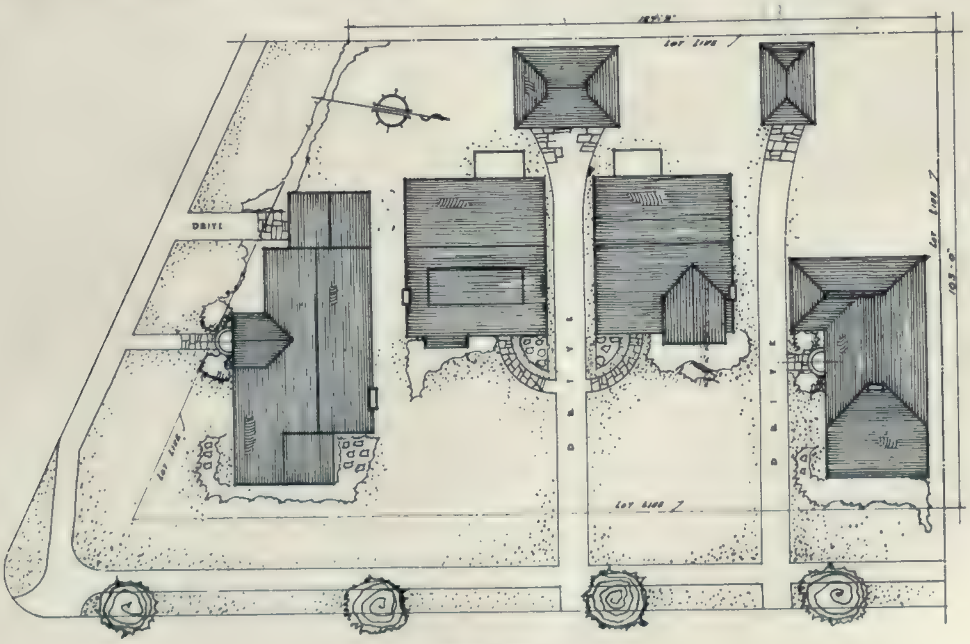
GROUP DEVELOPMENT, LYNDHURST AVENUE, TORONTO.

HAROLD R. WATSON, ARCHITECT.

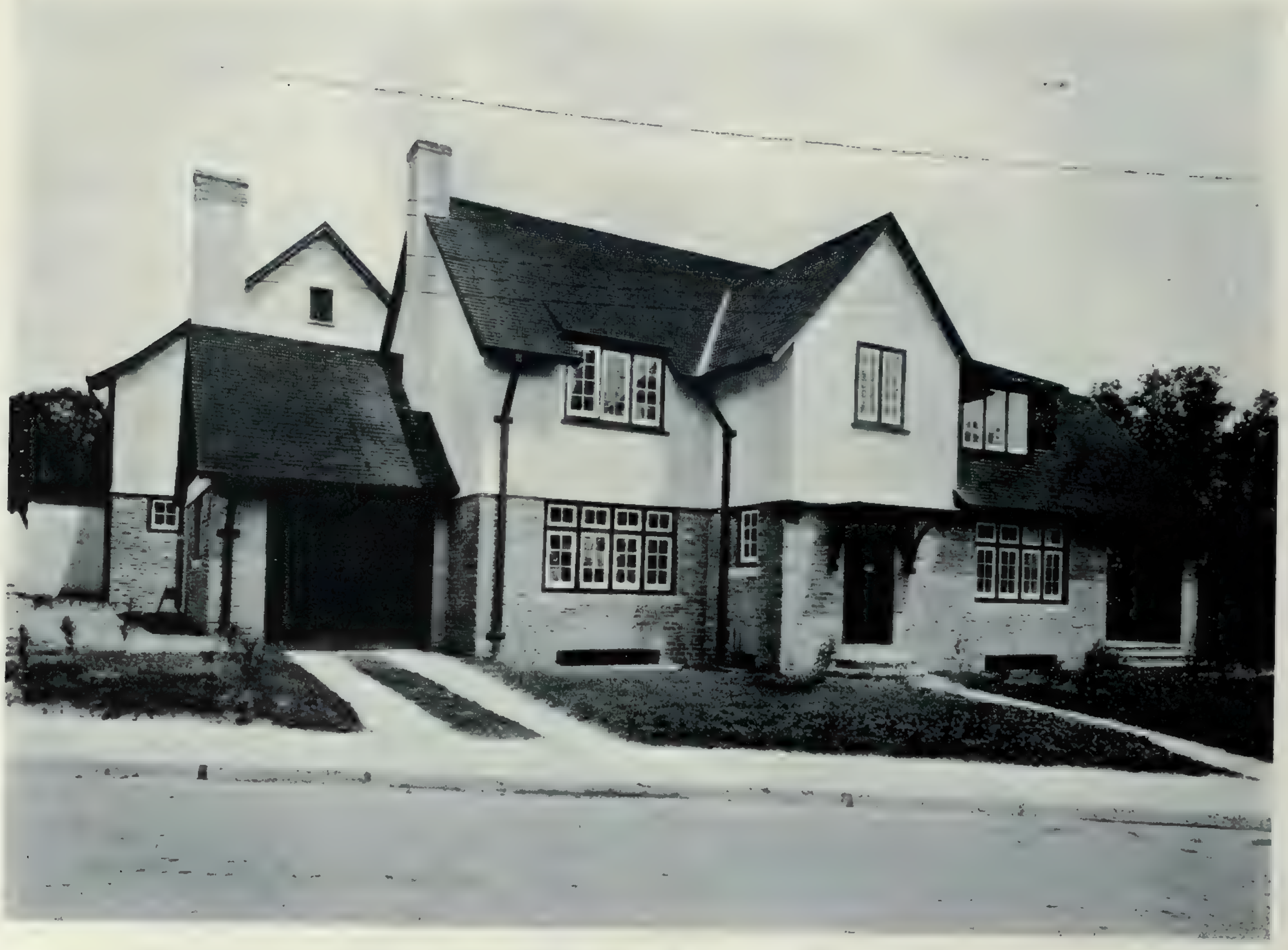
ceedingly monotonous type of architecture adjacent to the site. The south house, which is illustrated by plan, is just being completed, and its irregular contour was necessary through the slope of the adjacent street.

The living room feature is worthy of note through the excellent placing of the fireplace location to the north, which allows for a delightful southern exposure to the living room proper.

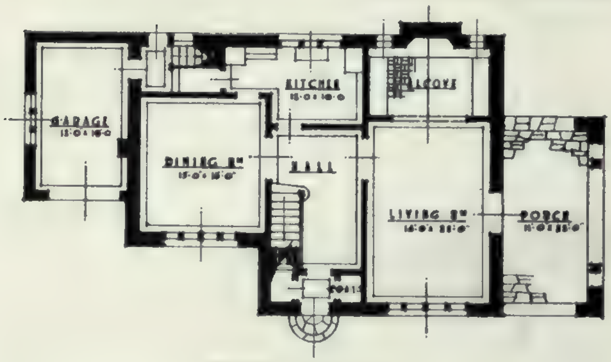
The house is finished downstairs with the exception of the dining room, in quartered white oak; the dining room is in gum wood, and the



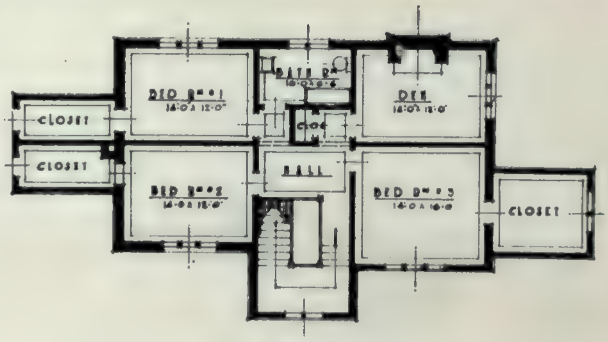
PLOT PLAN



SOUTH HOUSE, LYNDHURST AVENUE DEVELOPMENT, TORONTO.



GROUND FLOOR PLAN



UPPER FLOOR PLAN

porch has a flag floor. The upstairs is trimmed in pine with white enamel finish, and is provided with three generous clothes cupboards.

The grouping of the garage is interesting in showing the possibility of combining it as a harmonious treatment with the rest of the house.

◆

But little attention was paid to the needs for repair in Westminster Abbey during the war and it is now estimated by the Dean that it will be necessary to spend as much as $500,000 to put the structure in a condition worthy of so dignified and revered a monument. The present cost of maintenance has greatly increased since the pre-war period, and an appeal has been made for additional funds for the up-keep of the building.

Insulation of Concrete Walls*

By Nolan D. Mitchell, Structural Engineer, Supervising Architect's Office U.S. Treasury Department, Washington, D.C.

The maintenance of an even temperature in a house resolves itself into provision of adequate heating apparatus and a construction that will satisfactorily prevent rapid dissipation of heat through floors, walls and ceilings. It is just another phase of the problem that refrigerating engineers have found to be of such importance in their work, namely, insulation.

There is plenty of evidence that many builders realize the necessity of insulation against heat transference, but we are not so sure that

---

* Excerpt from an address delivered at the recent National Conference on Concrete House Construction, Chicago, Ill., U.S.A.

VIEW FROM STREET, LYNDHURST AVENUE DEVELOPMENT, TORONTO.

an altogether satisfactory solution has been found.

Let us look briefly into what has been done and the results. Wood furring with lath and plaster on the inside was probably the first effort to avoid penetration of dampness and the condensation of moisture on the inside of the wall. The result as far as insulating against the heat loss through an eight inch wall was an improvement of approximately 15 per cent. Where the wall block absorbed dampness from the weather the result was not so good for in general any porous material in moist or damp condition transmits heat much more readily.

The hollow block was another development in the right direction. The total result was probably not so very different from the wood furring except that it provided no lodgment for vermin and no runway for fire. The chances for dampness showing on the plaster were much higher, however, and there is no doubt that passage of dampness through the withes of hollow blocks is responsible for a large part of the long fight that advocates of concrete house construction have had to make to keep in the business.

Other builders realizing that dampness cannot travel by capillary action across a space bridged only by thin metal ties adopted that system and at the same time realized an improvement of about 20 per cent. over an 8-inch solid plastered wall. Hollow monolithic walls give about the same or perhaps a little better protection. The matter of detail of construction of the hollow wall is apparently more troublesome, yet with some builders they are still favorites.

A system, not so much in vogue, has been the building of solid walls of lean cinder concrete facing it with stucco on the exterior and plastering the inner face, or where the temperatures justify it, furring has been applied.

Another use of cinder concrete has been in making furring blocks to face the inside of the walls. I have not been able to find any data on the relative merit of these. One recent system embeds the porous block in the center of a monolithic wall so that the inner shell may serve as the supporting wall for floors and ceilings and thereby not break the continuity of the insulating course.

Other developments such as multiple cell blocks with offset withes, various forms of opening to allow freer circulation, etc., have been improvements in both insulating value and saving of materials.

A very popular building block is one made solid with projections on the rear face to bond with like projections on the blocks laid up to form the opposite face of the wall. This gives a good bond and is a simple arrangement easily cast allowing a wetter mix than that generally used in block construction.

All these efforts have made an appreciable improvement over the solid wall type, but generally the air spaces provided have been unnecessarily large and allow convection currents within the closed space.

A comparison of the results obtained by some of the above with the results of refrigeration insulating has led to investigation in a general way as to what might be done by using concrete as the structural member of the wall and combining with it an efficient insulating material.

As a basis a monolithic concrete wall 4 inches thick with 1 inch of corkboard insulation has been considered. It is not the intention to say that either the 4-inch concrete or the 1-inch corkboard is an ideal. In actual practice the thinnest concrete that will give adequate service and any insulating materials of the requisite qualities for the work should be used. There are many insulating materials on the market and if a demand is created for still different ones we may be sure that some resourceful manufacturer will soon be able to meet it.

There is no perfect insulating material. Of the more common ones the heat transmission factor varies very closely in proportion to the density of the structure. The cellular ones such as wood, pitch, cork, wool, etc., are best for house insulation. Any of these materials must be kept dry to give the best service.

The following table from "Mechanical Refrigeration" by Prof. Macintire of the University of Washington, gives the heat conductivity of some of our common building materials. The table indicates heat conductivity per square foot per inch thickness per degree difference in temperature per hour.

1 in. Common brick	4.66
1 in. Concrete (1:3:5)	4.29
1 in. to 4 in. Hollow tile	0.625
⅞ in. Lumber (tongued and grooved)	0.83
Air space (from 1 in. to 6 in. thick)	1.66
1 in. mineral wool	0.67
1 in. builders paper	0.30
1 in. pitch	0.79
1 in. shavings (dry)	0.67
1 in. granulated cork	0.48
1 in. cork board (all cork, compressed)	0.26
1 in. cork board (artificial binder)	0.28
1 in. hair felt	0.31
1 in. indurated fibre board	0.42
1 in. compressed mineral wool board	0.33

For thickness of insulating materials up to 8 inches the conductivity is in almost inverse proportion to thickness. The effect of change of temperature on conductivity is very slight through the range of temperatures required in house heating.

As a comparison of the 4-inch insulated wall with the two usual types of furred concrete walls the following is submitted from heat transmission tables compiled by Wm. R. Jones of the University of Pennsylvania. The heat transmission factors are:

(1) 8 in. solid concrete wall with 2 in. terra cotta or wood furring and plaster .... .53

(2) 8 in. hollow concrete wall (two 4 in. thicknesses of concrete) centre air space and furring as above .... .38

From Peclets formula the transmission factor of—

(3) 4 in. concrete wall with 1 in. cork board .18

Assuming that we have a house 26 by 26 feet in plan, two stories high with 1,450 sq. ft. net wall area, an average difference in temperature of 35 per cent. for 20 hours per day would show the following amounts of coal burned to make up for heat losses:

(1) 53.65 pounds per day.
(2) 38.57 pounds per day.
(3) 18.27 pounds per day.

Thus it is seen that the thin insulated wall would show a saving over the other types of 35.38 and 20.30 pounds of coal per day respectively.

Assuming that the condition as above continues for an average of 150 days each winter and that coal will cost $12 per long ton (U.S.) the savings capitalized at 6 per cent. for a thirty-year period would justify expenditures of $400 and $228 respectively for the insulated wall over the other types. Or to come back to the square foot unit, 27½ and 15.7 cents respectively.

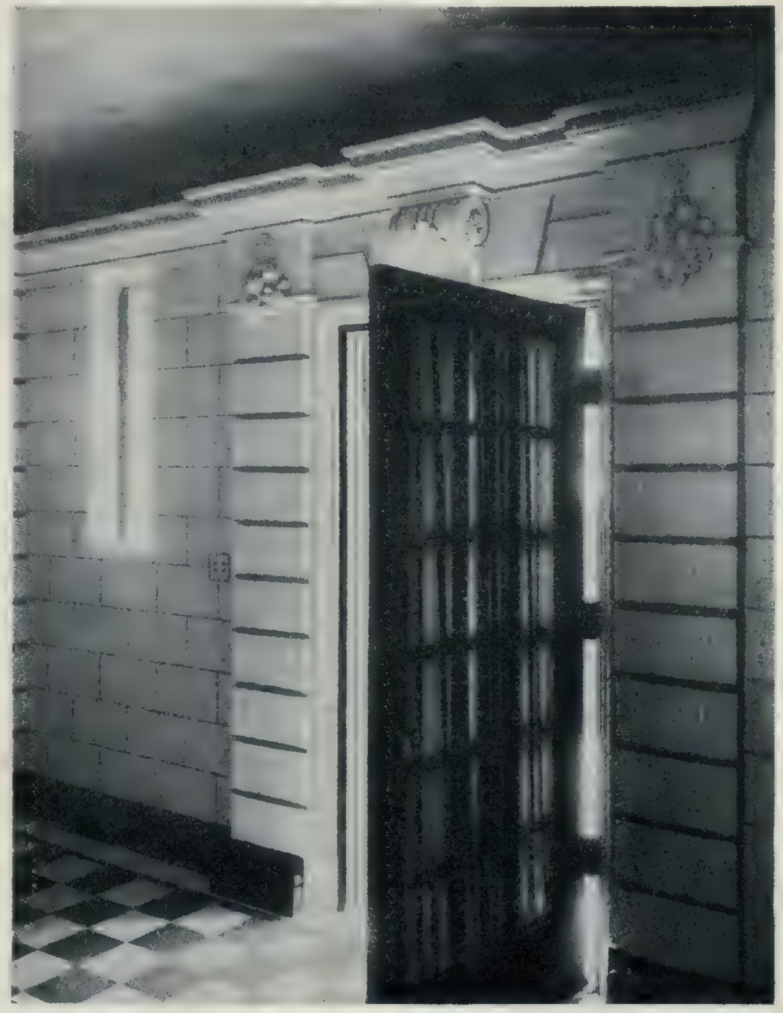
The saving of materials in the thin wall and the space saved by using them can be computed readily. If the same outside dimensions are maintained in the house the floor space for the thin type wall would be approximately 11 per cent. more than with the usual types.

The matter of increased comfort to the tenant has not been given a money value, but it is safe to assume that from a commercial standpoint that would be far more than any of the preceding. Once a builder has established a reputation for making a safe, satisfactory, comfortable house, economical in maintenance, he can be assured that his services will be in constant demand and his profits can be larger as a consequence.

Surface-Treated Concrete and Stucco*

By J. C. Pearson, U.S. Bureau of Standards, Washington, D.C., and J. J. Earley, Sculptor, Washington, D.C.

STUDIES of the experimental stucco panels at the Bureau of Standards led to the general conclusion that by adherence to well established practice, structurally sound and durable stucco could be secure, but that a great deal could be, or ought to be, done to improve its appearance. Crazing and map cracking is common to most stuccos, and are especially objectionally on surfaces of fine texture. The monotony of the cold grey cement color is objectional, and is only partially relieved by the use of white cement and mortar colors. Finally the muddy appearance (due to cement, or cement and pigment, being too much in evidence) is objectionable from an artistic standpoint. Consideration of these matters suggested at once the use of much less cement, and it became evident that by efforts in this direction improvement in appearance might be obtained. The apparently insurmountable obstacle to this departure from usual practice was, of course, the lack of plasticity in the leaner mixtures. Various methods of overcoming this difficulty were considered, and some experiments were made which indicated that a real improvement might be obtained by substituting fine inert material for a portion of the cement. The easiest way to accomplish this result seemed to be by using blended cements, that is, normal cements ground with a certain percentage of sand, stone-screenings, or other materials. These experiments were never carried very far, however, for it did not seem possible that any method which might be devised for retaining plasticity could bring about the desired result, namely, the elimination of all objectional features mentioned above.



Entrance to vestibule in private residence, Washington, D.C. An excellent example of the adaptability of exposed aggregate stucco and precast concrete of the same color and texture to exacting ornamental requirements.

Serious as was this lack of plasticity in the lean stucco mixtures, it was after all, something that could be overcome by *work.* This was demonstrated by the fact that mixtures as lean as one part cement to six parts of stone screenings were applied on some of the Bureau of Standards panels, with excellent results. But the improvement in these panels as compared with some of the easier working combinations did not seem great enough to justify the increased cost of application. The question finally arose whether by careful attention to gradation of the aggregates this improvement in appearance might not be so enhanced that the cost would be a secondary consideration.

This idea came from the fact that Mr. Earley had succeeded in making complicated casts of concrete from specially graded aggregates in such manner that a very large percentage of the area of the treated surface (first wire brushed and then washed) was aggregate, and a very small percentage cement. Possibly due in part to the higher reflecting power of the surfaces of the exposed aggregates, the color of the concrete surfaces thus produced was determined almost wholly by the color of the aggregates, and only very slightly affected by the cement itself. A most convincing demonstration of this fact was obtained by constructing two concrete slabs containing exactly the same proportions of specially graded aggregate, the one being mixed with grey cement, the other

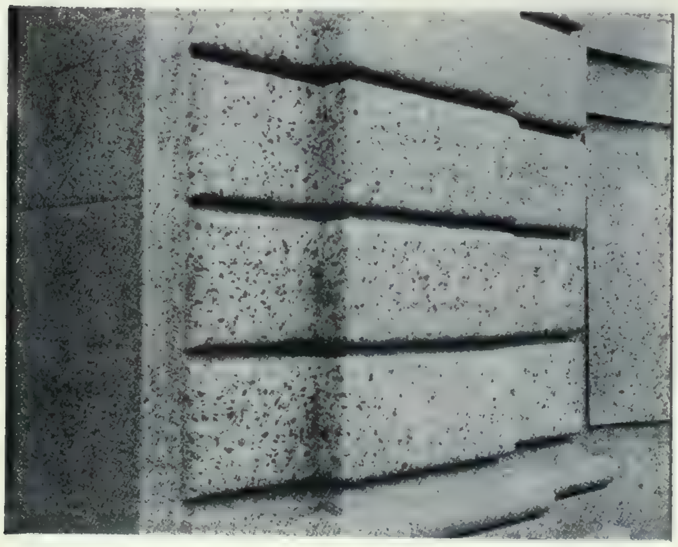
---

* Excerpt from an address delivered at the recent National Conference on Concrete House Construction, Chicago, Ill., U.S.A.

Vestibule to private residence, Washington, D.C. Console and cluster of fruit are of precast concrete; the remainder, including the moulding, is of exposed aggregate, portland cement stucco.

with white cement. After the surface treatment of brushing and washing had been applied, only an expert could have determined which slab contained the grey cement and which the white.

To digress still further for a moment, this method of obtaining permanent and very pleasing colors in concrete surfaces is such an important item in the development of the processes here described, that it is worthy of fuller explanation. Before color in concrete surfaces can be under artistic control, a technique must be developed which has for its medium the elements of the concrete itself. Although in problems involving appearance aggregate is by reason of its greater bulk the major element, and cement the minor, it is, nevertheless the color of the cement which is the natural color of normal concrete. The reason for this is that the cement is finely ground and deposits itself, paint-like over the surfaces of the aggregates and colors the whole mass. If, therefore, concrete is to receive its color from the cement paste, variation must be obtained by the addition of pigments to the cement following the well established practice of mixing paints; but if the aggregate is to be the source of color, the concrete must be so designed and manipulated as to deposit in the greatest possible amount of aggregate. Any great degree of success can hardly be expected in coloring concrete through the cement. The choice of colors is restricted by chemical reaction with the cement which causes them to fade or change; depth of color is restricted by strength requirements of the concrete, which limits very closely the amount of pigment which may be added to the cement. Therefore with the choice of color limited by one requirement and the depth of color by another, the cement itself must remain dominant. On the other hand, in coloring concrete through the aggregate all such restrictions are removed, and colors may be obtained from white to black, through all the range of possible aggregates. An examination of drawings done in hard pastelles and of paintings of the impressionist school suggests a technique in coloring which is peculiarly adaptable to the coloring of concrete by means of the aggregate. In the pastelles, tones are produced by hatching and cross-hatching with lines of pure color without blending on the surface of the drawing; in the paintings, by spotting with pure colors one beside the other and without blending. In both cases the tones are effected by the blending of the light rays reflected from the picture to the observer. Wonderful depth and clarity of tone are characteristics of this school of coloring, and in it are to be found a great deal of exact knowledge and valuable precedent. When this knowledge is translated in terms of concrete aggregates, it is obvious that if the aggregates are carefully selected and carefully placed, all the elements are present for the successful coloring of concrete surfaces. The results obtained in practice bear out the theory given above, and there is every reason to believe that the aggregate is the proper source of color for concrete.



Detail of Sixteenth Street entrance to Meridan Hill Park, Washington, D.C. Massive construction in which ornamental detail is well executed in concrete. Three textures are shown: fine on the revel of the arch (left), medium on the panel of the wall wing (right), and coarse on the rusticated blocks (center). The blocks are precast, the wing wall is monolithic, cast in place. The color is uniform throughout.

Hence it was a most important conception that a similar result might be obtained with stucco. The success of this depended, first, upon securing a suitable gradation of the stucco aggregate, and second, upon being able to apply such a mixture, once it were satisfactorily compounded. It was known at the outset that these mixtures would be harsh, therefore plasticity no longer played any part in the calculations.

The laboratory program was fairly simple. The plan consisted simply in working first with concrete mixes in miniature, in which the sizes of cement particles, sand particles and coarse aggregate particles were reduced from the normal sizes in the ratio of about 1:10, this being taken as the approximate ratio of the size of particles passing a No. 8 sieve to pebbles one inch in diameter. It was assumed that the density of such mixes would depend mainly on relative sizes of the component particles, with due allowance for the water content. If these mixes appeared to be satisfactory for the purpose, it was assumed that any reduction within the 1:10 ratio would also be satisfactory, and the actual reduction to be employed in compounding any given stucco mixture of this type would be as slight as the requirements of texture and the difficulties of application would permit. These experiments in the laboratory with the miniature concretes were very successful. Not the least important part of the laboratory work was the microscopic examination of the structures of these little concretes, which yielded many valuable suggestions for the gradation in size of particles, and for the proper proportions of the various sizes, to yield the desired effects in the treated surfaces.

The first attempt to apply the new product to a vertical wall was not wholly discouraging. Small areas were treated successfully, and eventually a portion of one of the new laboratories of the Bureau of Standards was coated with the exposed aggregate stucco. This example while it is not as free from imperfections as the more recent work, has attracted most favorable notice. Fortunately, the mechanics who were selected for this work developed a real interest in the new type of finish, and subsequently a pride in the results of their work, which made for very rapid progress in the development of the methods of application and treatment. New requirements in thoroughness of mixing, consistency, and control of the absorption of the undercoats were met, and other improvements in the general process were gradually introduced as essential parts of the routine. Not all of the problems have been solved, but there has been very gratifying progress in the comparatively short time that the new stucco has been applied commercially.

The writers believe that the work here described shows progress in the development of concrete and stucco as materials worthy of a place in the highest type of buildings or structures. It is to be noted especially that none of this work is an imitation of stone. Close inspection shows at a glance that it is concrete, with textures that vary widely, but always characteristic of concrete. Furthermore, the material may be cast in any form the architect may desire, with all details complete; no cutting, tooling or dressing is required other than the prescribed treatment of cleanly exposing the aggregate. Finally the material provides a medium for the expression of color in infinitely greater variety than that which obtains in the natural building stones.

In conclusion the writers would add a word about stucco. The new type of exposed aggregate finish cannot fail to arouse new interest in stucco, as a product, regardless of the nature and treatment of the finishing coat. The product should be more widely used, and, the reason it is not more widely used is that it has too often been applied by contractors or mechanics who consider it only as an outside plaster. This paper has attempted to convey the impression that cement stucco is more like concrete than plaster, and that plasticity is not essential. The point the writers wish to emphasize is that the art of applying durable stucco is very different from the art of plastering, and in their opinion, stucco will take the place it deserves among building products only when this fact is generally recognized.

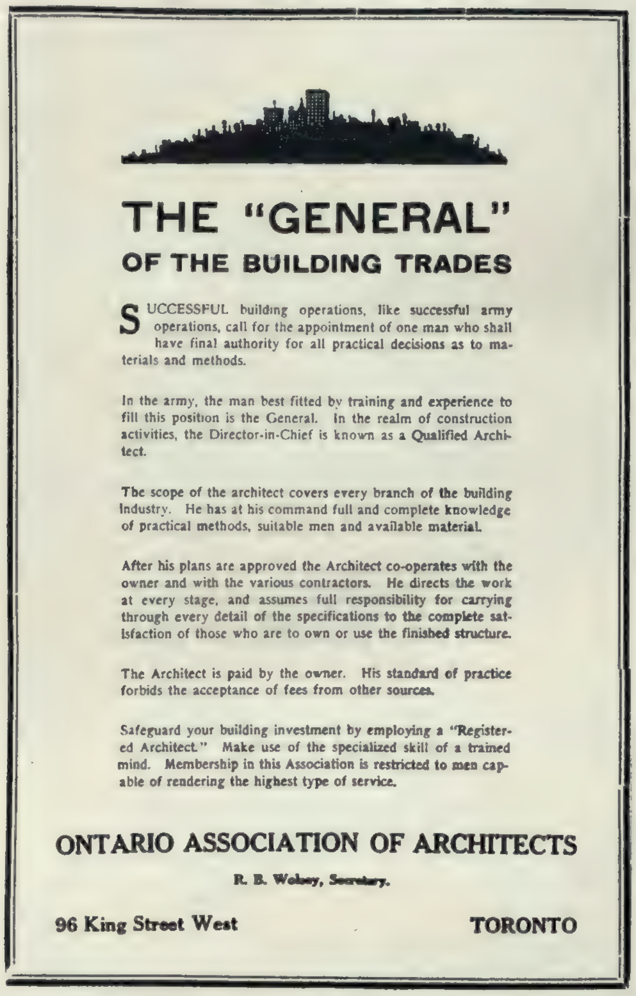
Rapid Electric Riveting

An electric riveter recently developed in Great Britain is capable of snapping a rivet of five-eighths of an inch in diameter in three seconds. All that the operator has to do is place the rivet in position and close a switch. The current used is so small that three hundred rivets can be closed for each kilowatt-hour of electricity consumed. The cost of current for such purposes is only a penny or two per kilowatt-hour.

New Map of Western Provinces

A new edition of a map of Manitoba, Saskatchewan and Alberta giving the number of quarter-sections available for homestead entry in each township with the boundaries and offices of Government land agencies has been issued by the Natural Resources Intelligence Branch of the Department of the Interior. This new edition clearly indicates all railways, forest reserves, parks and Indian reserves, also the land which has been reserved for soldier settlement purposes. The size of the map is 24 inches x 36 inches, and the scale 35 miles to one inch.

The importance of the new edition at the present time is apparent to prospective settlers, officials of banks, railway companies and land agencies, in fact everyone interested in the development of land in the Western provinces. A copy of this publication, which is known as the "Small Land Map of Manitoba, Saskatchewan and Alberta," may be obtained free of charge by applying to the Superintendent of the Natural Resources Intelligence Branch of the Department of the Interior, at Ottawa.



THE "GENERAL"
OF THE BUILDING TRADES

SUCCESSFUL building operations, like successful army operations, call for the appointment of one man who shall have final authority for all practical decisions as to materials and methods.

In the army, the man best fitted by training and experience to fill this position is the General. In the realm of construction activities, the Director-in-Chief is known as a Qualified Architect.

The scope of the architect covers every branch of the building Industry. He has at his command full and complete knowledge of practical methods, suitable men and available material.

After his plans are approved the Architect co-operates with the owner and with the various contractors. He directs the work at every stage, and assumes full responsibility for carrying through every detail of the specifications to the complete satisfaction of those who are to own or use the finished structure.

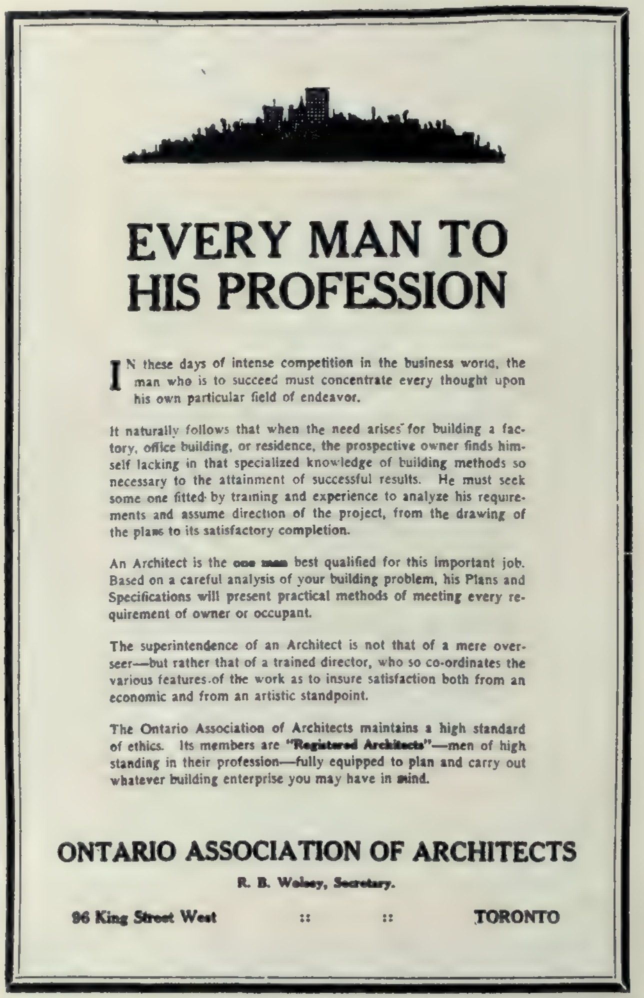
The Architect is paid by the owner. His standard of practice forbids the acceptance of fees from other sources.

Safeguard your building investment by employing a "Registered Architect." Make use of the specialized skill of a trained mind. Membership in this Association is restricted to men capable of rendering the highest type of service.

ONTARIO ASSOCIATION OF ARCHITECTS

R. B. Wolsey, Secretary.

96 King Street West **TORONTO**



EVERY MAN TO HIS PROFESSION

IN these days of intense competition in the business world, the man who is to succeed must concentrate every thought upon his own particular field of endeavor.

It naturally follows that when the need arises for building a factory, office building, or residence, the prospective owner finds himself lacking in that specialized knowledge of building methods so necessary to the attainment of successful results. He must seek some one fitted by training and experience to analyze his requirements and assume direction of the project, from the drawing of the plans to its satisfactory completion.

An Architect is the **one man** best qualified for this important job. Based on a careful analysis of your building problem, his Plans and Specifications will present practical methods of meeting every requirement of owner or occupant.

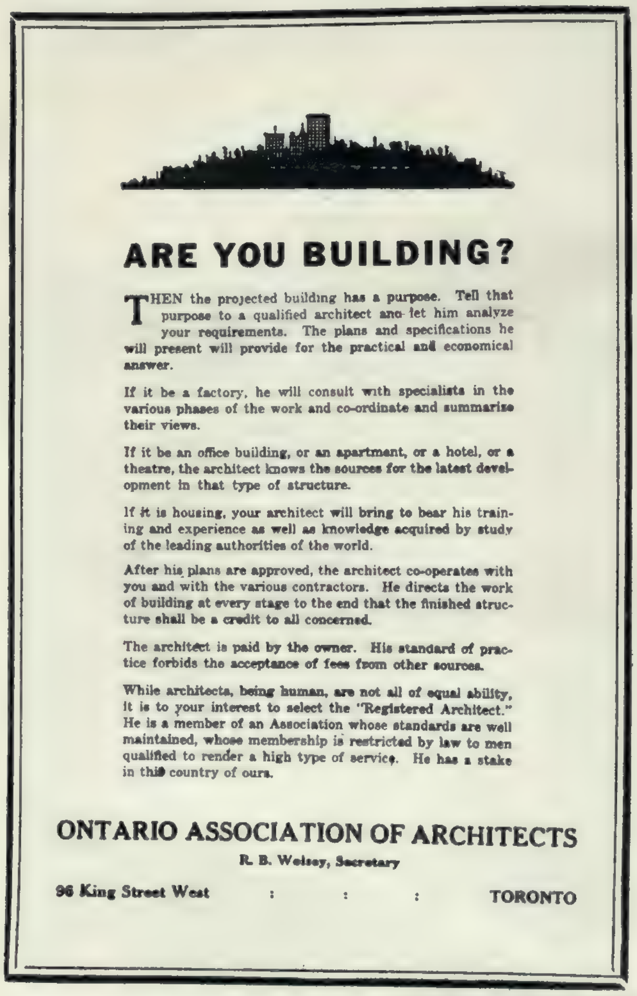
The superintendence of an Architect is not that of a mere overseer—but rather that of a trained director, who so co-ordinates the various features of the work as to insure satisfaction both from an economic and from an artistic standpoint.

The Ontario Association of Architects maintains a high standard of ethics. Its members are **"Registered Architects"**—men of high standing in their profession—fully equipped to plan and carry out whatever building enterprise you may have in mind.

ONTARIO ASSOCIATION OF ARCHITECTS

R. B. Wolsey, Secretary.

96 King Street West :: :: **TORONTO**



ARE YOU BUILDING?

THEN the projected building has a purpose. Tell that purpose to a qualified architect and let him analyze your requirements. The plans and specifications he will present will provide for the practical and economical answer.

If it be a factory, he will consult with specialists in the various phases of the work and co-ordinate and summarise their views.

If it be an office building, or an apartment, or a hotel, or a theatre, the architect knows the sources for the latest development in that type of structure.

If it is housing, your architect will bring to bear his training and experience as well as knowledge acquired by study of the leading authorities of the world.

After his plans are approved, the architect co-operates with you and with the various contractors. He directs the work of building at every stage to the end that the finished structure shall be a credit to all concerned.

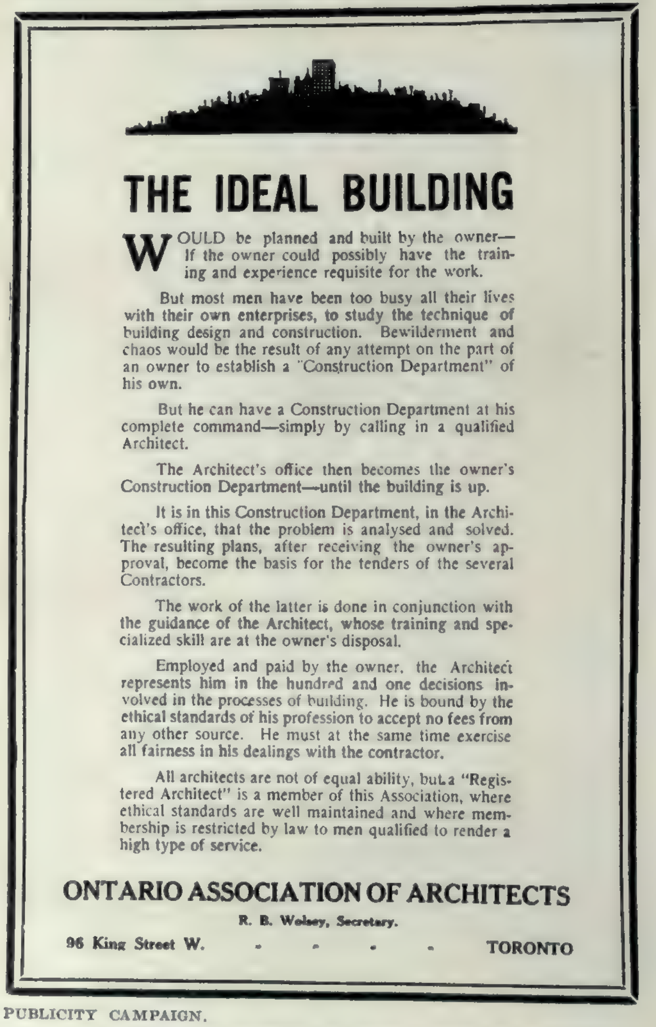
The architect is paid by the owner. His standard of practice forbids the acceptance of fees from other sources.

While architects, being human, are not all of equal ability, it is to your interest to select the "Registered Architect." He is a member of an Association whose standards are well maintained, whose membership is restricted by law to men qualified to render a high type of service. He has a stake in this country of ours.

ONTARIO ASSOCIATION OF ARCHITECTS

R. B. Welsey, Secretary

96 King Street West : : : **TORONTO**



THE IDEAL BUILDING

WOULD be planned and built by the owner—If the owner could possibly have the training and experience requisite for the work.

But most men have been too busy all their lives with their own enterprises, to study the technique of building design and construction. Bewilderment and chaos would be the result of any attempt on the part of an owner to establish a "Construction Department" of his own.

But he can have a Construction Department at his complete command—simply by calling in a qualified Architect.

The Architect's office then becomes the owner's Construction Department—until the building is up.

It is in this Construction Department, in the Architect's office, that the problem is analysed and solved. The resulting plans, after receiving the owner's approval, become the basis for the tenders of the several Contractors.

The work of the latter is done in conjunction with the guidance of the Architect, whose training and specialized skill are at the owner's disposal.

Employed and paid by the owner, the Architect represents him in the hundred and one decisions involved in the processes of building. He is bound by the ethical standards of his profession to accept no fees from any other source. He must at the same time exercise all fairness in his dealings with the contractor.

All architects are not of equal ability, but a "Registered Architect" is a member of this Association, where ethical standards are well maintained and where membership is restricted by law to men qualified to render a high type of service.

ONTARIO ASSOCIATION OF ARCHITECTS

R. B. Wolsey, Secretary.

96 King Street W. - - - - **TORONTO**

SPECIMEN ADVERTISEMENTS, O.A.A. PUBLICITY CAMPAIGN.

Four of a series of announcements (reduced half size) recently appearing in the Toronto newspapers with a view to educating the public to the value of competent architectural service.

CONSTRUCTION

A · JOURNAL · FOR · THE ARCHITECTURAL
ENGINEERING · AND · CONTRACTING
INTERESTS · OF · CANADA

H. GAGNIER, LIMITED, PUBLISHERS
Corner Richmond and Sheppard Streets.
TORONTO - - - - CANADA
M. B. TOUTLOFF, Editor
W. H. HEWITT, Advertising Manager.

BRANCH OFFICES:
MONTREAL—171 St. James Street,
E. R. Milling, Representative.
WINNIPEG—336 Qu'Appelle Street,
F. C. Pickwell, Representative.
NEW YORK—505 Fifth Avenue.
H. M. Bradley, Representative.

CORRESPONDENCE.—All correspondence should be addressed to "CONSTRUCTION," Corner Richmond and Sheppard Streets, Toronto, Canada.

SUBSCRIPTIONS.—Canada and Great Britain, $3.00 per annum. United States, the Continent and all Postal Union countries, $4.00 per annum, in advance **Single copies, 50c.**

ADVERTISEMENTS.—Changes of, or new advertisements must reach the Head Office not later than the twentieth of the month preceding publication to ensure insertion. Mailing date is on the tenth of each month. Advertising rates on application.

CONTRIBUTIONS.—The Editor will be glad to consider contributions dealing with matters of general interest to the readers of this Journal. When payment is desired, this fact should be stated. We are always glad to receive the loan of photographs and plans of interesting Canadian work. The originals will be carefully preserved and returned.

Entered as Second Class Matter in the Post Office at Toronto, Canada.

Vol. XIII Toronto, August, 1920 No. 8

The London Convention

All architects, whether they belong to an architects' association or not, have much in common and are meeting with the same general conditions and problems which are encountered in every day professional practice. It is therefore gratifying to note in the announcement of the executive that the convention of the Ontario Association of Architects, to be held at London on August 30-31, is to be an open meeting, at which all architects in the province, whether they are members of the O.A.A. or not, are invited to attend. Indeed, such a move on the part of the Council is to be commended. The injection of a little outside thought should do much to supply a fresh impulse and give that impetus to architectural deliberations which is so needed to-day.

To be perfectly candid, so far as association work is concerned, it has been chasing itself around in a circle on a few subjects of perennial debate. It has absolutely arrived nowhere as regards practical results and has failed signally in reaching anything in the way of real worthwhile achievement. The whole difficulty has been that the profession as a whole has not taken sufficient interest in its own affairs or the affairs of other related bodies. Apart from the executive council, such a thing as a general monthly meeting is practically unknown. True, the Toronto convention last October staged one of the finest public exhibitions of architectural drawings ever held in Canada, and set in motion a campaign of newspaper propaganda which should bear results, but aside from this, the most conspicuous feature of the event was the number of architects who attended the daily luncheons and stayed away from the business meetings.

This is a condition which should not exist. Unless architects take an interest in their own affairs, and voice in meeting the views and opinions which they privately express, nothing of a definite character can be accomplished. Association work cannot function entirely through executive council alone, but must represent the collective effort of the members who comprise it. What is required is more co-operation and a frank discussion of issues, such as will lead to some unanimity of opinion and a definite course of action.

Indeed the London convention which is scheduled to be a get-together-meeting will give an opportunity for initiating a progressive policy, and the fact that it is to be held at a place which is central to many points should warrant a large attendance and a full discussion of the subjects to be considered. Besides extending a welcome to architects in general throughout the province, the executive is also inviting the presidents of the Builders' Exchanges at London, Hamilton, Sarnia, Windsor and Ottawa to take part, and this should assure a most representative gathering. Among subjects on the program is a discussion to be led by Mr. Watt, of London, on "The Services and Value of the Association to its Members and the Public," and an address to be delivered by President Jackson of the Toronto Builders' Exchange on "The General Relations of the Contractor and the Architect." The latter, especially at the present time, represents an important subject, and might help clear up certain existing differences and promote a more mutual feeling between architects and those who do their work. There are likewise other vital issues to discuss, and it is sincerely to be hoped that the architects from all parts of the province will be on hand to lend their support and to help further the interests of the profession.

◆

The Question of Publicity

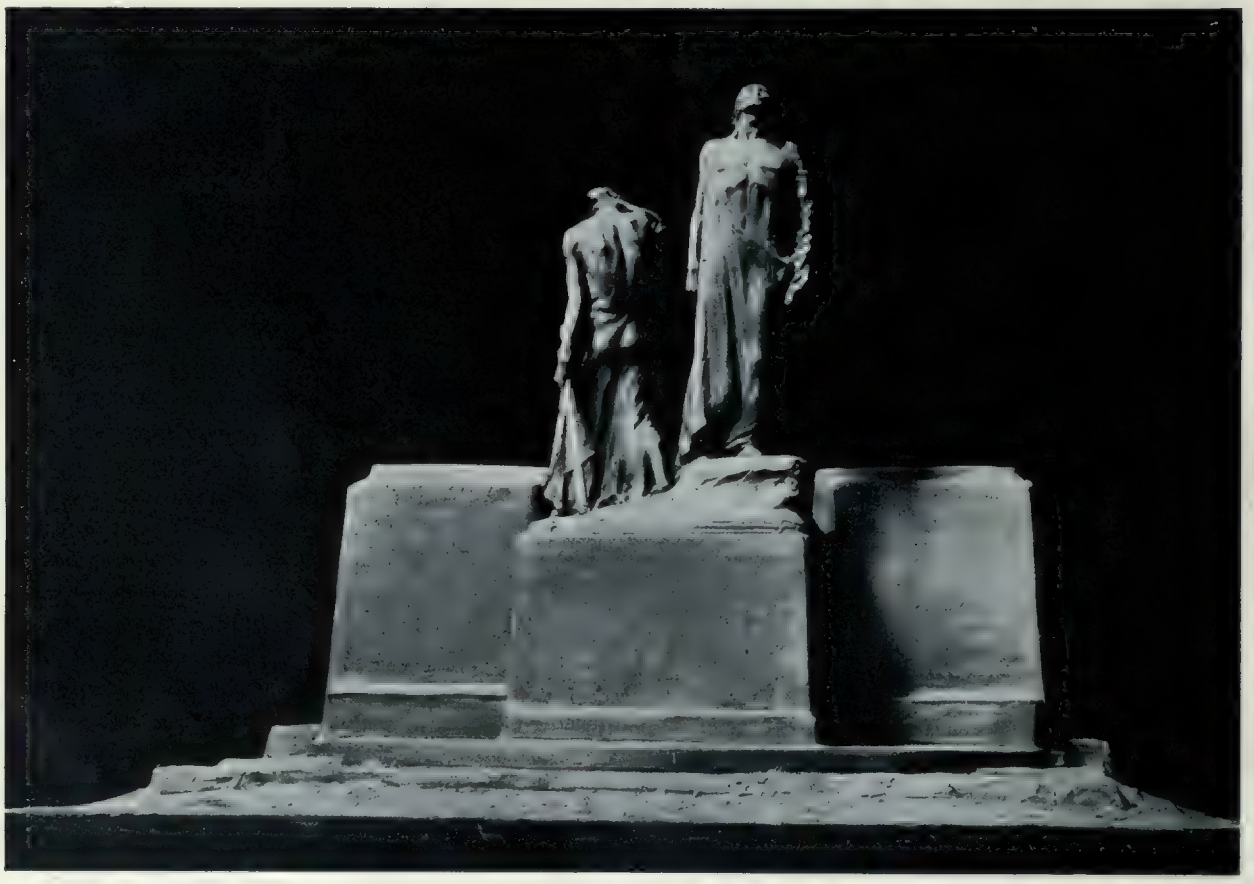
A matter which will undoubtedly be given attention at the O. A. A. London Coivention is the campaign of publicity which the association has been conducting in the daily press. Certain conditions have arisen which at the meeting in Toronto last fall made the step in this direction advisable, and while the experiment is as yet to near it inception to determine its benefits, there is no question that in time it will exert an inculcating influence in educating the public as to the value of competent architectural services. In fact a much wider scope of propaganda is at present being considered by the R.A.I.C. Council which is in correspondence with the various provincial associations with a view to securing subscriptions to a fund for this purpose. Specimens of the advertisements which have so far appeared are published elsewhere in this issue, and will enable architects in other parts of Canada to judge of their merits and the points of argument developed. We believe that they can in no way be constructed as being of a character which contravenes the code of ethics in the sense of commercial advertisements on the part of individual firms, but can be regarded more particularly as a series of dignified statements which are intended to benefit both the public and the entire profession.

R. A. I. C. General Assembly Dates

Notices have been sent out by the Council of the Royal Architectural Institute of Canada, announcing the dates of the Thirteenth General Annual Assembly which is to be held at Ottawa on October 1st and 2nd next. A meeting of the 1919-20 Council will be held at 9 a.m. on the first day and a meeting of the 1920-21 Council on the second day of the Assembly. The announcement states that a very interesting program is being prepared and that a large gathering of the profession is anticipated. Copies of the program will be mailed to members of the Institute early in September.

Architects to Compete for Monument

A press despatch states that architects and artists in Canada have been invited to submit designs for a monument to be erected over the grave of the late Liberal leader, Sir Wilfrid Laurier, in Notre Dame cemetery, Ottawa. The competition is under the direction of a sub-committee of the National Liberal Committee of Canada, and it is announced that in view of the



SKETCH MODEL FOR WAR MEMORIAL TO BE ERECTED BY THE CITY OF STRATFORD, ONTARIO.

The design, which is from the gifted hand of Mr. Walter S. Allward, of Toronto, is quite out of the ordinary run of "soldiers' monuments." The base will be granite and the figures bronze. The total width will run eighteen feet, and the total height sixteen, the figures being eight feet high. The tall figure on the high ground expresses the better, the spiritual man, while going down into the valley is the disarmed figure of strife, the group showing the supremacy of right over brute force. On the face of the centre base will be the words: "They Broke the Sword and Brought Peace to Our Land." On the side bases will be inscribed the names of Stratford's fallen heroes. The memorial when complete will be placed at the end of Erie Street, where it joins Ontario Street.

CONSTRUCTION

September, 1920 Volume XIII., No. 9

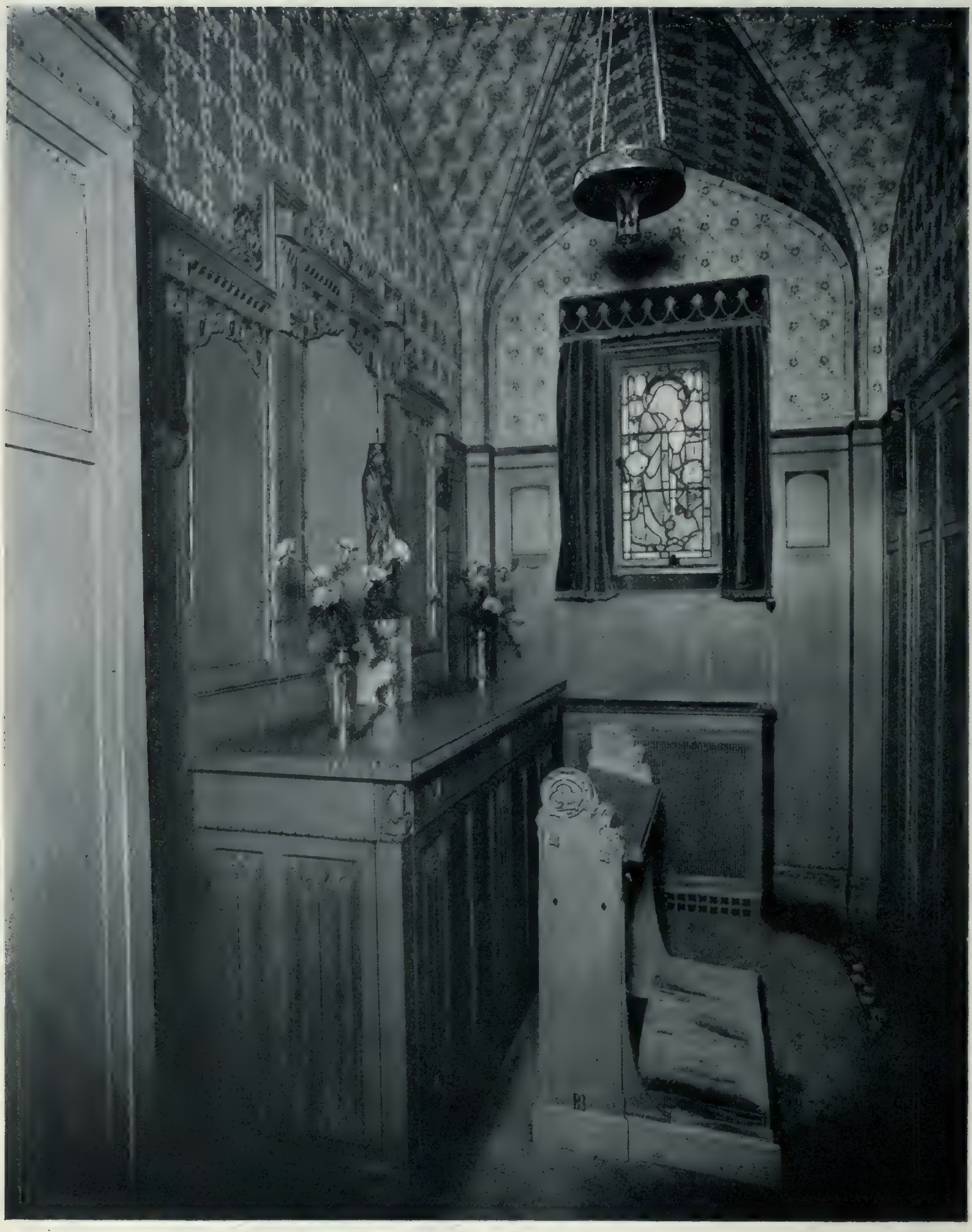
CONTENTS

AN ORATORY IN A MONTREAL RESIDENCE 269
DOUGLAS FIR OR OREGON PINE 271
LONDON O.A.A. CONVENTION 276
PRESIDENTIAL ADDRESS, O.A.A. CONVENTION 281
THE BUSINESS CONDUCT OF AN ARCHITECT'S OFFICE 283
By A. H. Gregg.
THE GENERAL RELATIONSHIP OF THE CONTRACTOR AND THE ARCHITECT 293
EDITORIAL 299

Illustrations

ORATORY IN MONTREAL RESIDENCE (Frontispiece) 268
CARVING SKETCHES FOR ORATORY, MONTREAL RESIDENCE 272-275
CATHOLIC OFFICE BUILDING, TORONTO 287
RESIDENCE OF J. D. WOODS, ESQ., TORONTO 288
RESIDENCE OF MRS. CHARLES CATTO, YORK MILLS, ONT. 290
RESIDENCE OF FORSEY PAGE, ESQ. 293
TENNIS HOUSE OF SIR FRANK BAILLE, OAKVILLE, ONT. 294

H. GAGNIER, Limited, Publishers
GRAPHIC ARTS BLDG., TORONTO, CANADA
BRANCH OFFICES
MONTREAL NEW YORK



AN ORATORY IN A MONTREAL RESIDENCE.

E. & W. S. MAXWELL, ARCHITECTS.

An Oratory in a Montreal Residence

THE problem given the architects was to design an oratory to go in a small room adjoining the principal bedroom on the first floor of a residence, which they had planned.

The floor space available was six feet wide by ten feet six inches deep, lighted at the end by a small metal casement window. The problem included introducing a figure of the Virgin, three feet six inches high, and it was agreed that at some future time the figure might be replaced by a carved one of smaller size, and greater sculptural interest. It was quite obvious that refinement of detail and scale would have to be adhered to, and owing to the size of the Virgin, destined to go in the centre of the composition, no canopied niche treatment could be made use of to provide a setting for the figure.

The style adopted was Gothic, but in its development there is very little adherence to any specific period. The ceiling is of plaster, vaulted in form, and covered with a Japanese grass cloth of silvery quality. A stencil with a pattern based on the square, yet possessing a distinct diagonal motif, was used for the decoration of the material; the predominating colors being blue, a rather primrosy yellow and the silver background of the cloth which contrasts agreeably with the water color stencilling. The blue note is repeated more firmly in the velvet curtains and the woven rug with a narrow decorative border recalling in a lower key, a simplified repetition of the ceiling color scheme.

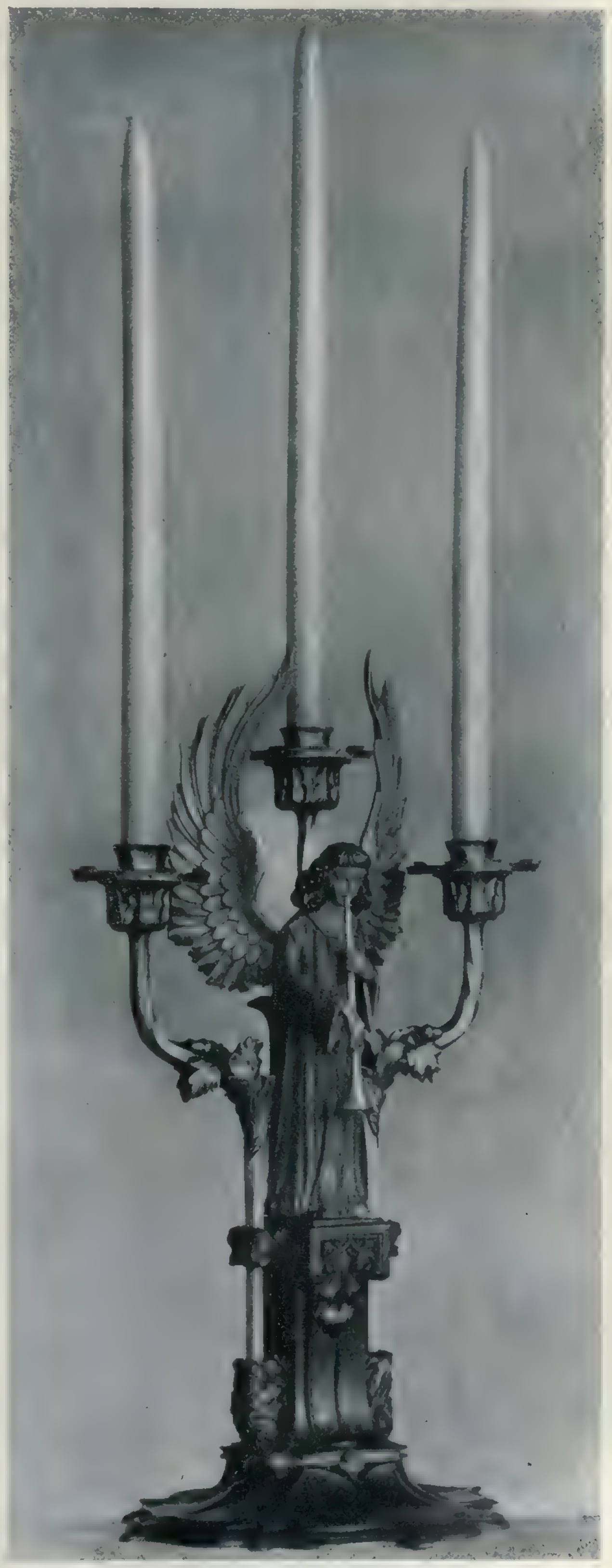
The waxed oak woodwork is finished in an unassertive silver grey, and the carved figures of pine are polychromed, closely following some sixteenth century ones in the architects' possession.

The casement window has been excellently designed and executed by Mr. Archibald Davies of the Bromsgrove Guild, the Virgin and Child being the motif.

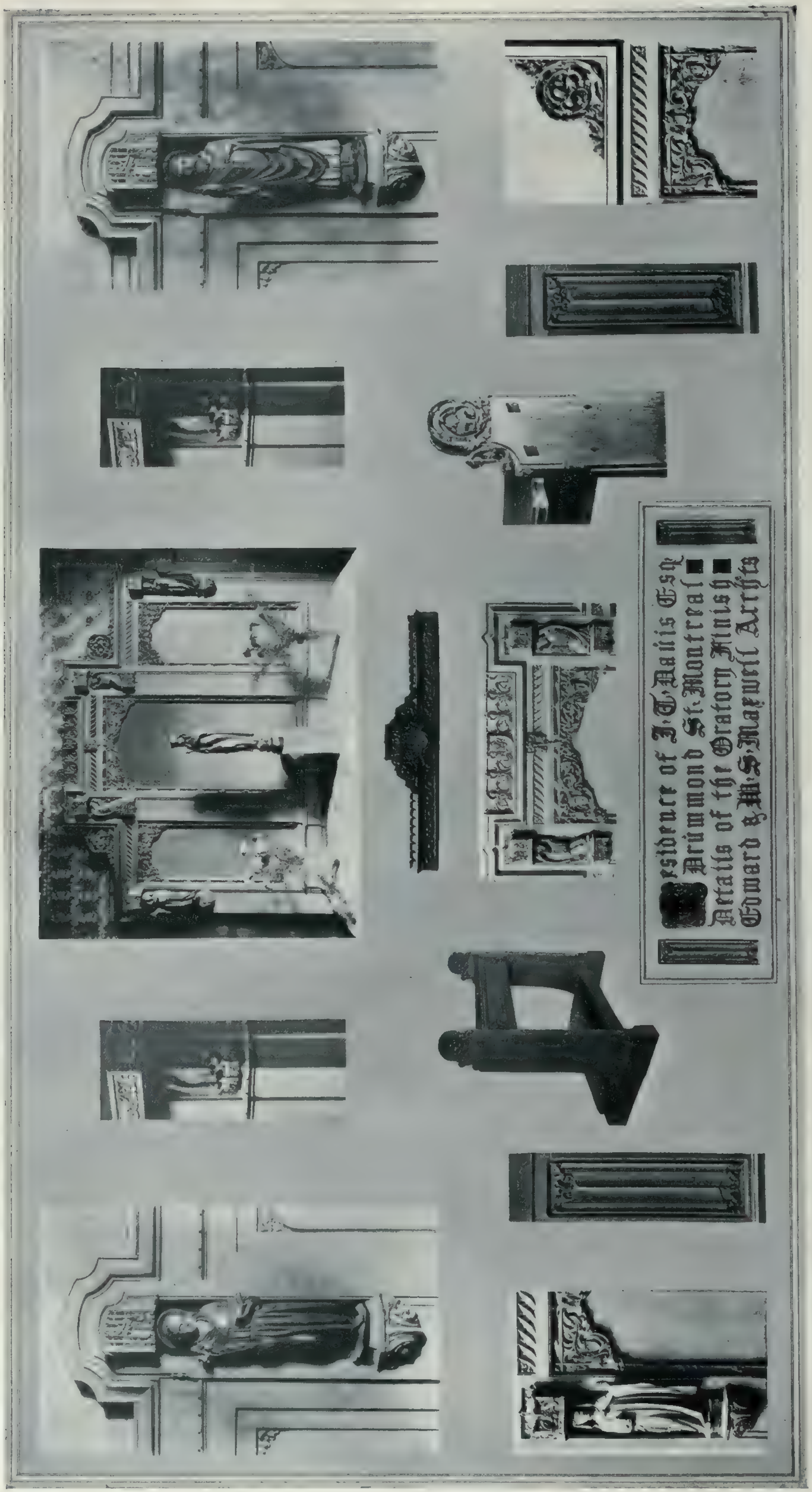
In the execution of the work a sufficient amount of money was available to permit the selection of craftsmen who were considered entirely suitable for the execution of the work. Every detail was carried out locally, with the exception of the stained glass window, and the rug was woven in Ireland from the architects' design.

The lighting scheme consists of a suspended fixture carved out of walnut, stained quite dark and with mountings of pierced and wrought silver. The interlacing band has a background of blue velvet, the same material being used as in the curtains. The indirect light furnished is very agreeable and not brilliant. The effect of light on the ceiling is agreeable and the pattern is much less strongly marked than the flashlight photograph indicates.

Two candelabra of carved walnut go on the altar table either side of the statue of the Virgin. The illustration of the interior shows a smaller Virgin than the one the architects had to accommodate, and the two vases of flowers stand where the candelabra are now placed, as



ALTAR CANDELABRA.


Residence of J. T. Davis Esq
Drummond St. Montreal
Details of the Oratory Finish
Edward & W. S. Maxwell Archts

DETAILS OF ORATORY, MONTREAL RESIDENCE.

E. & W. S. MAXWELL, ARCHITECTS.

they were not finished when the photograph was taken. The candelabra recall certain early Gothic examples in so far as the conception is concerned, but the development of form and detail is free and rather individual. The winged angel is carved in pine and polychromed, the arms supporting the candles are of silvered metal, very well chased by Mr. Paul Beau. A reserved use of color, more particularly to obtain an agreeable patina, has been introduced in the walnut base.

The oak panelling on the walls is extremely simple and low in relief, the upper panels being enriched with rosettes.

The lower member of the cornice has a pattern of small squares of white mahogany and rosewood inset in the oak fillet. On the wall opposite the altar two pilasters terminate with niches containing carved polychromed figures of saints.

The minute scale of detail can be judged by these figures, which are less than twelve inches high.

The altar table has linen fold panels of varied design, and on each angle under the top there is a pelican sitting on its nest, the symbol of self-sacrifice.

The reredos panelling has three large panels terminated with pierced interlacing ornament; the centre one being filled with the same blue velvet as the curtains. Figures of adoring angels and two of St. Anne in a niche terminate the four pilaster panels.

The curtains of blue silk velvet with a very delicately marked Jaspe stripe, have silver fringes, and the valance is embroidered in silver thread.

Some of the architects' full size details of ornament as reproduced, they are of interest in comparison with the finished work, and because of their being the vehicle by which the designer conveyed his aspirations to the craftsmen.

The oratory conveys the impression of being larger than it really is, and although the altar and Prie-Dieu are of a suitable size, there remains sufficient space to permit of its use with comfort.

Douglas Fir or Oregon Pine

DOUGLAS fir is found in Canada only in the Provinces of British Columbia and Alberta, the amount found in the latter being very small by comparison. "It reaches its best development in the region directly tributary to salt water between the mouth of the Columbia river and Seymour Narrows. . . . With the exception of the giant sequoias and redwoods of California, it is the largest on the Pacific Coast. It ordinarily attains a height of 175 to 200 feet and a diameter of 3 to 6 feet. Not infrequently trees up to 250 feet in length and from 6 to 9 feet in diameter are seen. Owing to its intolerance of shade, the lower branches soon die and drop off, leaving one-half to two-thirds of the bole clear and a large percentage of the wood free from knots.

"In the virgin forests on the Coast, where fir predominates, the stands usually run from 20,000 b.f. to 50,000 b.f. per acre, though frequently, on the better sites, the yield exceeds 100,000 b.f. per acre; one instance being recorded where 5,000,000 b.f. was cut from ten acres. Single mature trees ordinarily contain from 2,000 to 5,000 b.f., but, sometimes, exceed 10,000 b.f. In the mountains, the fir stands usually run from 5,000 to 15,000 b.f. per acre, though in some of the more moist valleys stands are found almost equal to those on the coast. In the interior dry belt the individual fir trees usually contain from 500 to 2,000 b.f." ("Forests of British Columbia," H. N. Witford and R. D. Craig).

There is estimated to be 76,000,000 M. board feet of Douglas fir in British Columbia. In 1919 the total cut of this species for the province was 841,605 M. board feet.

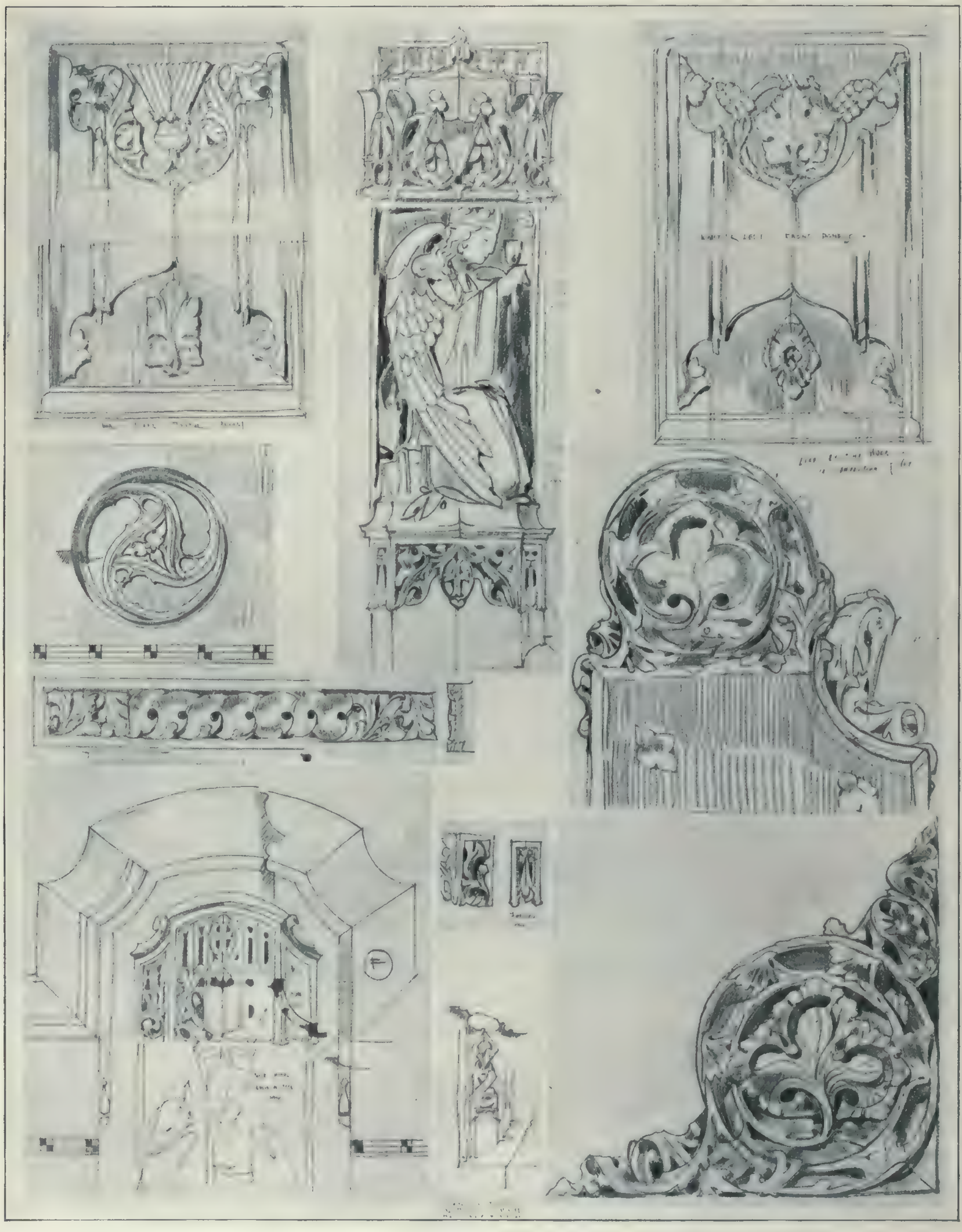
The uses to which Douglas fir is put are extremely varied, some of the main ones being included in the following list: light and heavy building construction as joists, studding, beams, posts, flooring, interior trim, doors, and casings; bridge construction; derrick sticks and dredge spuds; piles and poles; ships' decking, planking, keels and ribs; tanks, pipe and silo stock; cooperage and veneers.

The wide range of uses to which Douglas fir is put is due to its great strength, beauty of grain, durability, and the fact that it produces very clear lumber in exceptionally large sizes.

Douglas fir is widely recognized as the strongest structural soft wood in the world, with the exception of southern long leaf pine, with which it is given equal working values. For some purposes, as for example, in building poists where only a slight defection is allowable, Douglas fir is superior to white oak.

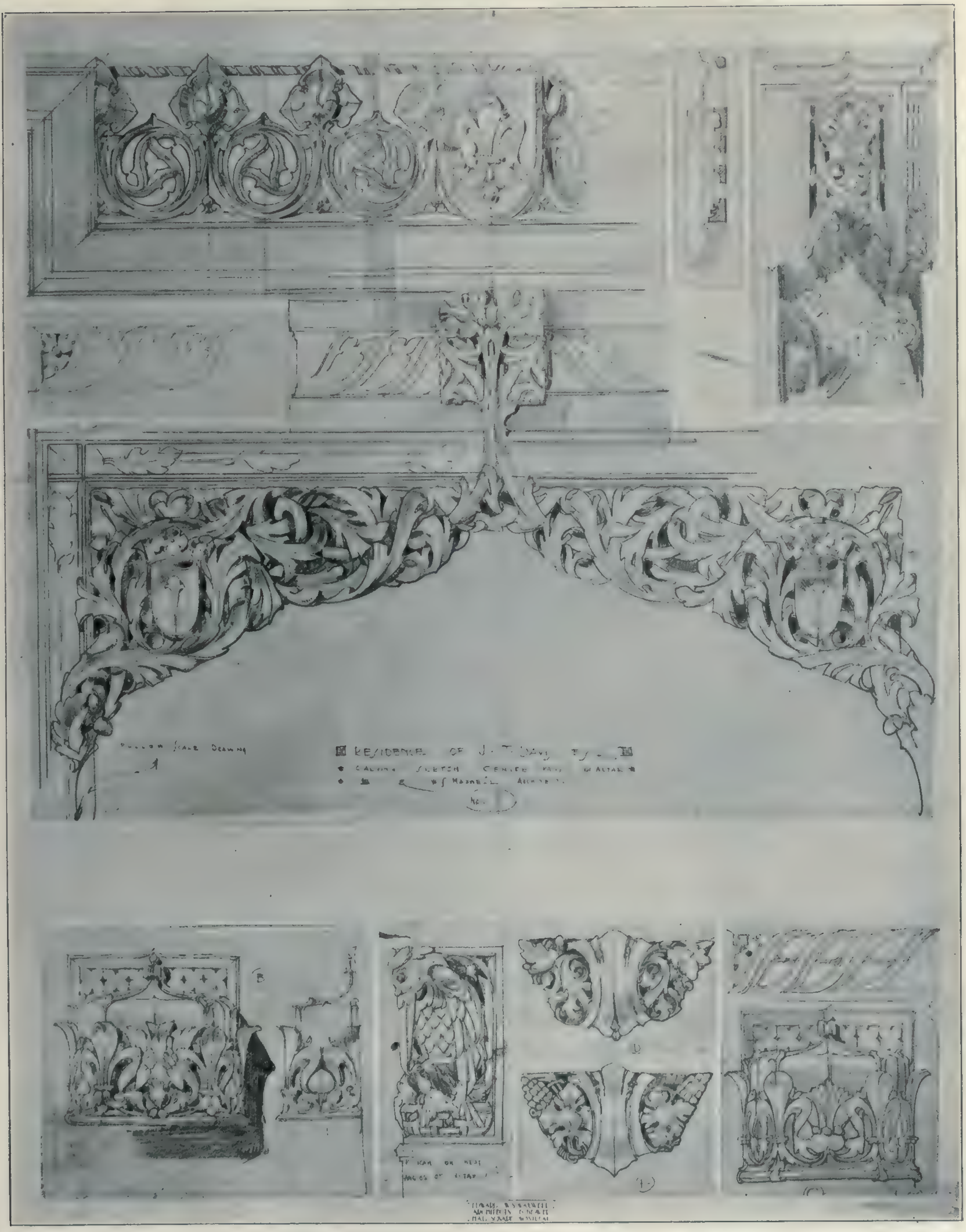
Thousands of tests have been accurately made on both small and structural sized specimens of Douglas fir to ascertain correct working values which should be allotted to it. The United States Forest Products Laboratories situated at Madison, Wisconsin, have been established for ten years, during which time they have made upward of 500,000 tests on wood. Their bulletin, No. 88, entitled "Properties and Uses of Douglas Fir," contains the most authentic information available on the strength and structural sizes of this material. The results of a very thorough series of small tests on Canadian Douglas fir were published in 1918 by the Forest Products Laboratories of Canada. These

(*Concluded on page* 292.)



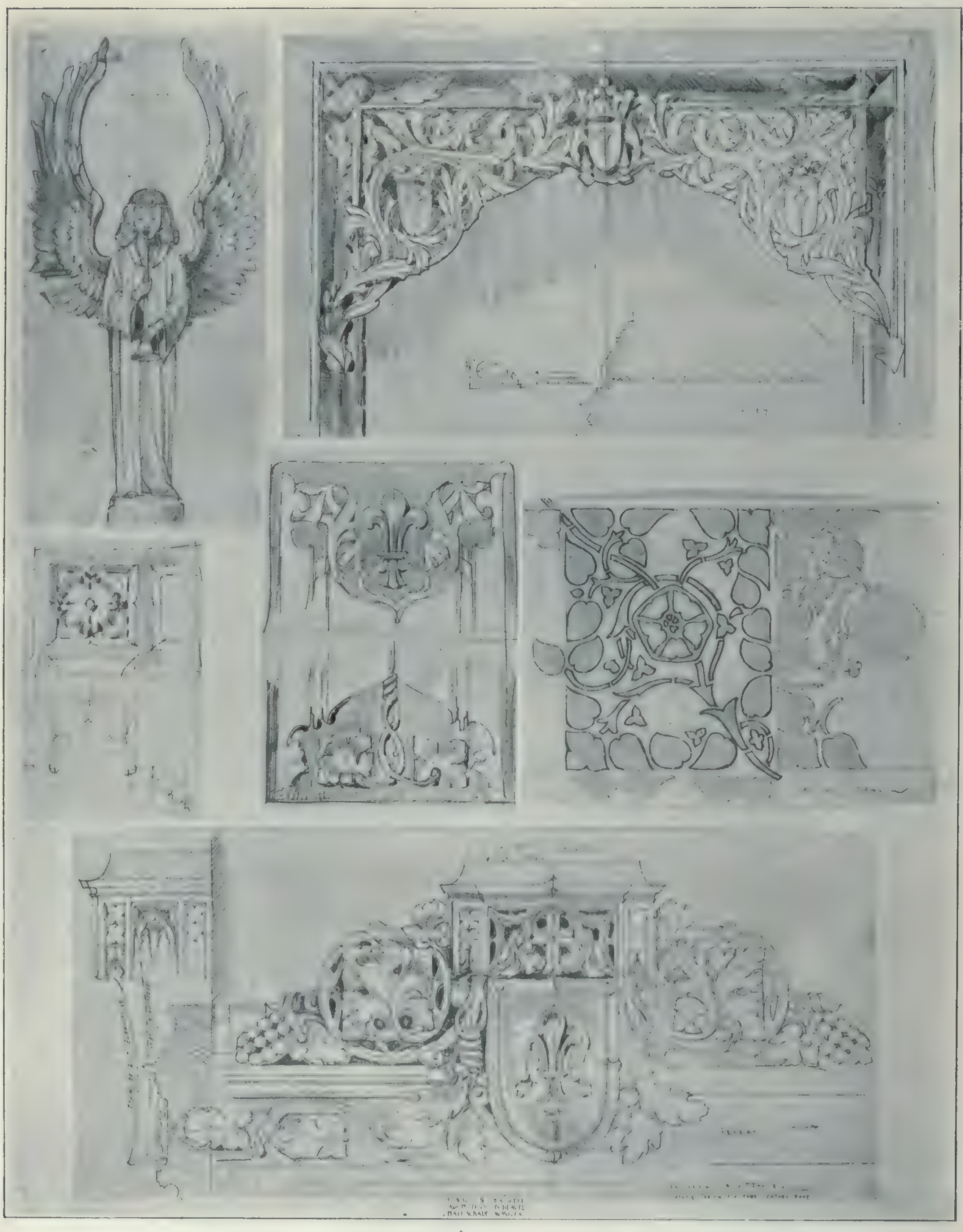
CARVING SKETCHES AND STENCIL DESIGN FOR ORATORY, MONTREAL RESIDENCE.

E. & W. S. MAXWELL, ARCHITECTS.


RESIDENCE OF J. T. DAVIS ESQ.
CARVING SKETCH CENTRE PANEL ALTAR
E & W S MAXWELL ARCHITECTS
Scale Drawing

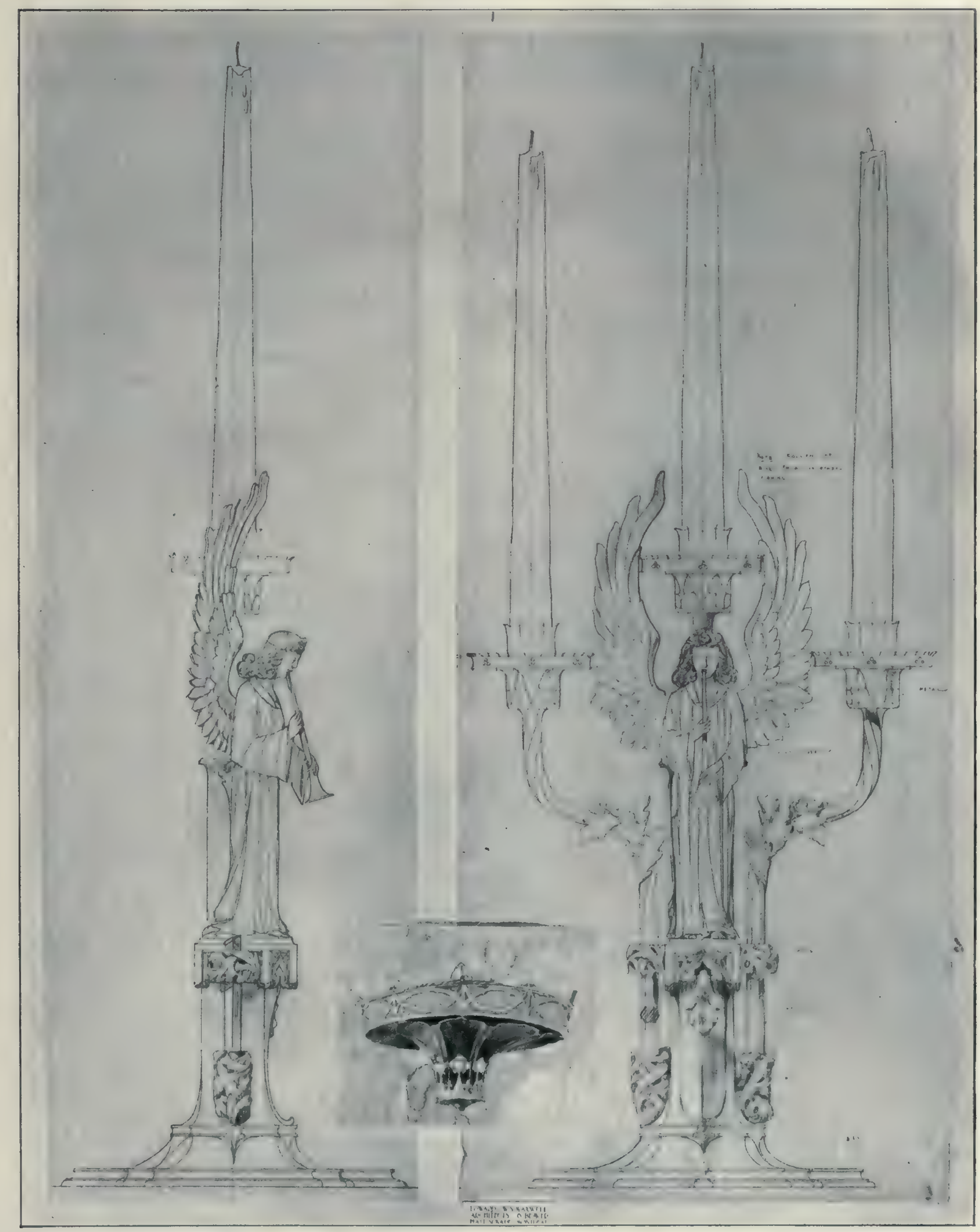
CARVING SKETCHES FOR ORATORY, MONTREAL RESIDENCE.

E. & W. S. MAXWELL, ARCHITECTS.



CARVING SKETCHES AND STENCIL DESIGNS FOR ORATORY, MONTREAL RESIDENCE

E. & W. S. MAXWELL, ARCHITECTS.



SKETCH OF CANDELABRA IN ORATORY, MONTREAL RESIDENCE.

E. & W. S. MAXWELL, ARCHITECTS.

The London O. A. A. Convention

THE London Convention of the Ontario Association of Architects on August 30-31, will go on record as one of the best and most important meetings the association has yet held. It was an open meeting and the first gathering of its kind where practationers of the province, regardless of their affiliations, met for the joint discussion of issues. Moreover, it was of a nature which should effectively consolidate the profession in Ontario and bring it closer to the accomplishments of its objects. The business sessions, which were held in the Tecumseh House, represented at the very least a busy two days' period in which many important subjects were presented for discussion. These dealt with both practical and ethical questions and involved a number of points having a direct bearing on the welfare of the profession. Two important subjects discussed were in reference to "The Service and Value of the Association to its Member and the Public" and "The Relations of General Contractor and the Architect." The meeting went emphatically on record as being opposed to any architect engaging in the contracting business, or in any deviation in conduct from that dictated by the code of ethics.

Committee Reports

At the opening session the convention devoted its time mainly to the consideration of the reports of the various committees.

Following the address of President H. E. Moore, which is published in full elsewhere in this issue, and which was a lucid presentation of the various phases of association work, stressing the changed conditions of the times and the resultant effect on the practice of the profession, both the registrar's and treasurer's reports were received and adopted.

In connection with the latter report, it was suggested that the policy adopted by the council during the year regarding the prompt payment of dues be strictly adhered to; also that an entire new set of books be opened with proper receipt forms and that a chartered accountant be employed to advise as to the best system to adopt and to make the necessary audit. It was felt further desirable that some steps should be taken to increase the revenue of the association. The financial statement for the year was as follows:

FINANCIAL STATEMENT.

Receipts:		
Balance from 1919	$481.61	
Fees collected	2,326.50	
Publicity subscriptions	835.00	
Bank Interest	18.33	
		$3,661.44
Expenditures:		
Running Expenses, Postage, petty cash	$112.15	
Printing	207.82	
Travelling expenses	15.10	
Insurance	9.27	
Rent	100.00	
Secretary	300.00	
Contributions to committees	55.00	
		799.34
Convention and Exhibition, 1919		1,058.93
R.A.I.C. Fees, 1919-20, 1918-19		492.00
Publicity Expenses to date		682.21
		$3,032.48
Cash Balance		628.96
		$3,661.44

Assets and Liabilities.

Assets:		
Uncollected Fees	$920.85	
Less for bad debts	500.00	
		$420.85
Unpaid Publicity Subscriptions		300.00
Balance in Home Bank		628.96
Furniture and Books and Lantern	$550.00	
Less for depreciation	150.00	
		400.00
Credit due from R.A.I.C.		100.00
		$1,849.81
Liabilities:		
Outstanding accounts, printing, travelling expenses, etc.		47.00
Estimated advertising accounts unpaid		550.00
		$597.00
Surplus Balance		$1,252.81

In support of the recommendation for increased revenue, it was pointed out that the present membership of the association, approximately 150, yielded a current yearly revenue in fees, outside of arrears, of $1,885. The annual running expenses indicated in the report submitted amounted to about $800. To this must be added about $300 for R.A.I.C. fees, and the expenses in connection with the London Convention being held could be put down at, at least, $500, making a total of $1,500. This left a probable balance of $300, which was altogether inadequate for effective association work. The general desire, it was felt, was to increase the activities of the association, and to do this it was also necessary to have more funds available to accomplish better and more widespread results.

It was further stated that the last normal year before the war, the association membership revenue was something over $800, and that immediately on the outbreak of the war it was decided to remit the fees of members on active service. That covered some 30 members, and cut deeply into the revenue. After the first year of the war, it was considered a hardship to collect dues which were reduced to a nominal fee of $7.50 a year per member, out of which the association kept its members in good standing in the Institute. This, coupled with the fact that practically no new membership was added, and that the council did not resort to sharp measures to collect dues, explained the poor financial showing up to the present. In the past year, however, the council has endeavored to live up to the by-laws, which still allow a member to be three years in arrears before his membership could be dropped. With the question of fees better regulated, the general revenue should be substantially increased, and the time, it was felt, had arrived, when it was necessary to consider a vigorous campaign reaching toward a larger membership and a greater usefulness for the association as a body.

REPORT OF BOARD OF ADMISSION.

The report of the Board of Admission showed there had been 32 applications sent in during the year. Of this number, 11 were recommended for membership and one applicant, who had previously been a member of the R.A.I.C., was admitted by the Council. Eight were recommended for associate membership; one of whom refused this award and later on withdrew his application. In addition to this, seven applications were rejected, two were withdrawn; one has been held over for further consideration; while two applications were now in the hands of the board awaiting consideration.

Attention was drawn to the fact that only about 50 per cent. of the architects practicing in the province were enrolled on the register, and that the Toronto membership was overwhelming as compared with the rest of the province. It was felt very strongly that the activities of the membership committee should be widened, and that every effort should be made to get all qualified practitioners to come into the association.

Reports of the representatives to the Toronto Art Gallery and the Ontario College of Arts were also received at the meeting. The first-named report stated that it was somewhat to be regretted that there were so few architects holding membership in the Art Gallery. The membership fee for architects was only $5, and not only were members entitled to the privileges of the opening nights, but they could by their membership materially assist the Gallery. One important act of the Gallery during the year was the donation of a site for the Ontario College of Arts, the building of which was already begun.

CANADIAN NATIONAL EXHIBITION DEVELOPMENTS.

A report in reference to the proposed developments at the Canadian National Exhibition was submitted, indicating the activities of the association in regards to a systematized plan of grounds and buildings, and read as follows:

"Your representatives attended the annual meeting, at which directors were elected and business transacted, and was successful in having a resolution passed that the city (Toronto) be requested to provide proper plans for the whole of the grounds owned by the city and looking forward to such extensions as may be probable in the future.

"The agitation for this was started by our association and was cordially backed up by the Board of Trade, the Civic Guild, and the Rotary and Kiwanis Clubs.

"A committee was appointed to carry out the scheme, and it will be referred to in the address of the President.

"It was disappointing that no further opportunities were afforded for active work in the association. Your representative was asked to act on the Educational Committee, and consented to do so, but received no notice of any meeting since appointment, and find that others are in like position. It is probable that when the Exhibition is over the committees may be called together."

President Moore stated in reference to the foregoing that the Commissioner of Parks was engaged in the preparation of the necessary survey of the work in question, which would enable a professional man to take hold and make his suggestions. It was necessary that the incoming Council should follow up the matter closely, as the necessity for a scheme such as is contemplated is altogether apparent.

REPORT OF PUBLICITY COMMITTEE.

Much interest of the meeting centred in the report of the Publicity Committee, and resulted in a general expression of opinion which gave unanimous support to the policy adopted at the Toronto Convention last year in regard to the question of advertising. This report was presented by Mr. Bannigan in the nature of a chalk talk on what had been accomplished during the past year. Mr. Bannigan stated that about $1,100 had been subscribed for this purpose, which with two notable exceptions was almost exclusively from Toronto members. The committee decided on two mediums of advertising, viz., the daily newspaper and the classified advertising section in the telephone book. The classified advertising section simply listed the names of the members who contributed and were practicing under the title of "Registered Architects." The other which was in the nature of newspaper advertising, had first to be discussed from the standpoint of what was to be said and the best way to say it. Three points were finally decided on: (1) to explain to the public the function of an architect, (2) to explain the difference between a registered and an unregistered architect, and (3) to make the public familiar with the name and purpose of the Association. The series of advertisements published cost approximately $900, including the telephone book advertisement. The results, Mr. Bannigan stated, had to some degree been remarkable. While advertising of this kind was not expected to bear tangible results, such, however, in several instances had proven to be the case.

In addition, certain benefits had accrued in the way of editorial comment in the daily and technical press, on such subjects as "The Claims of the Canadian Architect," "Made-in-Canada Goods," and "Ethics Used in Advertising," the latter appearing in *Printers' Ink* and stating that the U.S. architects might well copy the Ontario Association. A notable increase in membership and greater interest in all matters relating to the Association could also be traced to this advertising campaign. Moreover, the intangible results of this publicity—the recognition by the public of the value of an architect—could not be estimated in words or figures, but there was no question that it really exists. But to capitalize this it was necessary to continue advertising and to devise some means whereby funds for this purpose could be raised. Less than one-third of the members of the Association have so far subscribed, and it seemed fair, if the thing was to be spread out over the entire province, that the entire Association should pay for this on a per capita basis.

Another point in this connection was the advisability of engaging a paid secretary who could prepare articles of public interest, such as would be acceptable by the newspapers, criticizing various buildings and dealing with architecture in general. This was a work far too heavy for a committee of architects who were practicing, and there were in Toronto men who have had experience on architectural journals as editors or contributors, whose service might be available at a limited cost for this purpose.

There was also the suggestion that the Association make certain awards of medals to practicing architects who had completed a successful or noteworthy building. The publicity features of a medal of the Association, could not be overlooked, as well as the influence it would exert in promoting an *esprit de corps* within the Association itself. In a word, group advertising was doing three things—benefiting every member by putting the entire work of the Association on a higher plane before the public; it was benefiting most of all the weakest men in the Association, which is what the Association should do; and besides this, it was meeting all possible outside competition by using advertising as a preventative instead of using it as a last resort sometime in the future as a curative. The reference here was to the ready-made factory and house, the designing contractor and numerous other competitors who are invading the architectural field. To overcome existing evils it was necessary to resort to the public press and that requires money and sacrifice on the part of each member for the good of the Association.

A final matter which should be considered, Mr. Bannigan said, was the fact that the R.A.I.C. had received from the Manitoba Association a request that the Institute conduct an advertising campaign for the entire Dominion, and in this connection, desired to know by the 15th of September if the Ontario Association would favor the joining of a Canadian-wide campaign, and if so, how much money could they provide. It was therefore a question as to whether the Association would continue its own advertising campaign, and how much it would appropriate, or as to whether it would join in this more widespread movement, taking in the whole of Canada.

REGISTRATION.

The representatives on the Advisory Committee of the Engineering Institute of Canada on Legislation, reported that the committee was practically the successor to a similar committee of the Joint Committee of Technical Societies of Toronto.

The committee had made an exhaustive digest of the legislation now in existence controlling the practice of architecture and engineering, and it was interested to note that part of this was Acts passed at the last sessions of New Brunswick, Manitoba and Saskatchewan Legislatures. These Acts created an association of architects and engineers, which appointed two-thirds of a council, while the Provincial Government appointed one-third. The council examines and registers architects and engineers, and only those so registered are allowed to practice in the province.

The present committee has not yet reported, but it is expected to recommend similar legislation for Ontario.

The Association's members on this committee were struck with the absence of any argument of a conclusive nature that appeared in the digest before the committee, as to why such legislation should be enacted, and submitted the following for the convention's consideration:

First.—That it is not the duty or the obligation of the present practicing architects to provide the educational facilities for the rising generation of architects.

Second.—That the practice of any profession should not be controlled by the practitioners in it, but by the Government, and that evidence of a standard efficiency to practice should be exacted as a basis for registration.

Third.—That as the community requires trained men to handle its problems, it is the community's business to provide the means by which the training may be obtained.

Fourth.—That the present practice in Ontario of providing the training facilities in the university and then failing to give the men so trained any station above the untrained practitioner is economically wrong. If the province provides training in architecture and engineering, it is because it recognizes there is a need for men in this profession to solve its problems. Recognizing this, it is logical that the opportunities for practice should be conserved for those whom the province educates; otherwise the Government defeats the purpose of the trained facilities it provides.

Fifth.—That if the men qualified by the universities were registered by the Government and the practice of province conserved for them, the community would be assured of properly trained men to handle its problems and the trained manhood of the province would be developed and conserved.

The practice of law, medicine, dentistry and pedagogy in Ontario being conserved, these professions have risen to distinction and the province is proud of their accomplishments. It is felt that Canada has better doctors than many of the older states on the other side, and the same applies to dentistry and veterinary surgery. There is equally good reason for conserving the practice of architecture and engineering as for conserving the practice of any other profession, and it is the duty of the educational administration of the province to see that this is done.

The thing was parallelel exactly by the teaching profession, the province needs teachers and requires them to be educated up to a proper standing. It gives the facilities for their training and registers them and allows no other teachers to practice in the provincial schools. Similar provision should be made with regard to all callings in which the province considers it necessary to provide facilities for training. In fact, this is in a measure now done with all but the technical professions, and the province has admittedly benefited as a result. Like benefits would also accrue if the Department of Education would establish a register for architecture and engineering and the standards on which it should be based, and be responsible for its administration. The Illinois legislation was the nearest to what was required. It places the matter of registration under the jurisdiction of the Department of Education, and was the most effective legislation enacted in any of the nineteen States having registration acts for architects.

JOINT INDUSTRIAL COUNCIL.

The Joint Industrial Council of the Toronto Building Trades reported that the Association's representative had acted as chairman of this Council since its inauguration in March, 1919. Its object was to facilitate conferences between the employers and the employees and endeavor to overcome differences before they become acute. An outstanding instance of the Council's work is the agreement between the employers and employees taking effect on the 15th of September, 1920, by which they undertake to settle their wage scale before November 15th, or allow it to then automatically go to arbitration to be settled before January 1st, that the question of wages may be settled before the new work for the ensuing year is entered upon.

Following the morning session, the architects were tendered a luncheon by the London Rotarians, which was a most delightful event in every way, with songs, speeches and an abundance of good fellowship contributing to the enjoyment of the occasion.

ASSOCIATION WORK AND ITS BENEFITS TO MEMBERS.

At the afternoon session Mr. John D. Watt of London, speaking on "The Service and Value of the Association to the Public," urged that one open council meeting be held annually in each of the four main cities outside of Toronto, namely, Ottawa, Hamilton, London and Windsor. This would help to remove the misapprehension held by some that the Association was principally an organization for Toronto architects.

Other suggestions made in this connection were (1) that members of the council be selected to more widely represent various sections of the province, (2) that a detailed report of all important subjects dealt with at each meeting of the council be sent to every member of the Association, (3) that copies of the revised schedule of fees enlarged and suitable for framing be sent to all belonging to the Association, with a request that the members display this schedule prominently in their offices, (4) that a copy of the by-laws be sent to non-members together with a membership application blank and a letter inviting all who can to fulfill the obligations set forth to join the Association.

In the general discussion which followed it was pointed out that the architectural profession had the reputation generally speaking of being solely an artistic profession, and as a penalty has greatly lost ground as well as business from those who control the building expenditures in Canada. Also that it was necessary for the profession to develop its business acumen and business organization, or to restrict itself to the mere designing of buildings and not administration. This in turn led to a question involving the permissibility of an architect engaging in the dual capacity of practitioner and contractor, which the Convention disproved as being detrimental to the best interests of architecture.

An interesting address was also delivered by President C. Blake Jackson of the Toronto Builders Exchange, on the subject of "The Relations of the General Contractor and the Architect."

Among the advantages pointed out in having construction work undertaken by a general contractor were, gain in the speed of construction, better co-ordination in the various divisions or parts of the work performed by the different trades and the different sub-contractors. The latter knew that the general contractor had to have the work finished within a specified time limit, and worked with him to facilitate the completion of the work.

Discussing estimates and estimating costs, Mr. Jackson declared these constituted a big part of the contractor's overhead expenses. Buildings actually constructed had to pay for buildings only planned or estimated upon.

ANNUAL BANQUET.

At the conclusion of the afternoon session the members as guests of the London and Port Stanley Railway journeyed to Port Stanley, where the annual banquet was held. After an inspection of the bathing station and enjoying its advantages in a practical way, an excellent dinner was served in the large dining hall of the Pavilion, where appropriate toasts were proposed to the "Profession," "The Building Industry," and "The Press," and an altogether delightful evening spent in convivial discourse.

OFFICE ADMINISTRATION.

The morning of the second day of the Convention was taken up mainly by a discussion based on a paper read at the meeting by Mr. A. H. Gregg on "Business Conduct of an Architect's Office." This speech developed a number of valuable suggestions and was a matter of mutual interest. The general consensus of opinion was that a more frequent discussion of ideas among architects with reference to their affairs and more friendly co-operation as regards the loan of plans and similar services would greatly benefit the profession.

At luncheon on this day the architects were the guests of the City and the London Chamber of Commerce, and had the opportunity of listening to a splendid report by Mr. Naulon Cauchon on the "Railway Problem of London," involving the solution of the railway grade crossings together with the development of a Union Terminal and Civic Centre.

COMMITTEE REPORTS.

Routine business and the election of officers occupied the greater portion of the afternoon period. The Committee on Resolutions submitted the following report:

RE REGISTRATION.

This Convention having heard the report of its representatives on the Committee of Legislation of the Ontario Division of the Engineering Institute of Canada, considers that, whereas the practice of architecture should be based on the educational qualification of the practitioner, on the protection of the public, and the development of the manhood resources of the Province, and whereas the Provincial Government supports educational institutions to supply the province with men trained to handle the problems that arise in the community, and at present practically in all but the technical professions conserves the practice in the province for the men so trained.

Be it resolved that this Association take steps to have this practice extended by the Ontario Government to architecture and the other technical professions, and to this end recommends to the Government that some such form of legislation to control professional practice as is now in force in the State of Illinois, be enacted in Ontario; and further, that the representatives of this Association on the Legislation Committee of the Ontario Branch of the Engineering Institute of Canada be instructed to support only such recommendations from that Committee as harmonize with the Illinois Act.

INCREASE IN FEES.

Whereas the Convention approves of the work done during the past year by its Publicity Committee and realizes the desirability of extending the work by a more widespread campaign, and whereas the Convention approves the holding of council meetings in different towns and cities throughout the Province when deemed advisable by Council for the purposes of arousing interest in these towns and cities in its work, and whereas in order to carry out such suggestion more funds are needed, be it resolved that the fees of the members be increased to $25.00 per year, of non-practicising members to $15,00 per year, and of associates, to $10.00 per year.

REFERRED TO COUNCIL.

The following was referred to Council:

That copies of the schedule of professional charges, enlarged and suitable for framing, be sent to all members with the request that this schedule be framed and hung in their offices.

That copies of the professional charges in leaflet form be sent to all architects in Ontario who are not members of the Association.

That some short time after the schedule of charges are sent out, copies of the By-Laws and membership application forms be sent to all architects in Ontario who are not members of the Association, requesting that if they can subscribe to the conditions laid down therein, they submit their application for membership.

That the various provincial associations be communicated with in regards to the enlargement of the scope of the Royal Architectural Institute of Canada, dealing with such matters as publicity campaigns and the issuing of bulletins concerning the practice of architecture throughout the whole Dominion, and thus developing as far as possible a unanimity of effort.

A further resolution was adopted congratulating Mr. Henry Sproatt of Toronto, who recently received the honorary degree of LL.D. from the Toronto University, and extending a vote of thanks to the Council and those who had delivered addresses and contributed to make the Convention a success.

ELECTION OF OFFICERS.

The election of officers resulted as follows: President, Herbert E. Moore (re-elected); 1st vice-president, R. K. Shepard, Toronto; 2nd vice-president, John M. Watt, London; treasurer, Gordon M. West, Toronto; registrar, J. P. Hynes, Toronto. Members of Council: A. Stuart Allaster, Brockville; J. Frank Kelly, Hamilton; R. B. McGiffin, Toronto; Colborne P. Meredith, Ottawa; J. Forsey Page, Toronto; A. Frank Wickson, Toronto.

Following this session, the visitors enjoyed a motor drive around London as the guests of the City, and had an opportunity of inspecting some of the more recent schools.

The Convention closed with an open meeting at the Y.M.C.A. Auditorium, at which Mr. W. D. Cromarty of Ottawa spoke on the Inter-Allied Town Planning and Housing Conference recently held at London, England. This address was of special interest particularly to architects and others who are interested in town planning and housing developments in Canada, and will be dealt with fully in the next issue; a feature being a number of lantern slides and moving pictures of garden suburb schemes and town planning developments carried out in England and suggesting in a practical way ideal possibilities where similar undertakings are being studied or contemplated.

President H. E. Moore's Address

Delivered at the recent London Convention of the Ontario Association of Architects.

FOR years past it has been the custom, or shall I characterize it as a habit, of this Association to hold its annual convention in Toronto and Ottawa, the one exception to the rule being the year previous to the war, when it was held in Hamilton. It is, therefore, with considerable pleasure that I accept this opportunity of addressing the members on this the first occasion of a convention assembled in London. We are indebted to our live and energetic confrere, Mr. John M. Watt, for his presentation of the claims of London as this year's convention city, and let me add that the policy advocated by Mr. Watt of a better distribution of the annual meetings, as well as the Council meetings, is in my opinion, one that will tend to make our Association more representative of the membership at large.

Last year's joint convention of the Association with the R.A.I.C. might well be termed a reorganization meeting, as it was the first held since the outbreak of war, and as a consequence there was much to be done and much still remains to be done in order to bring the Association to a point considered efficient in value to its members and to the public.

One of the principal aims of the Association is to promote good architecture and by the character of practice of its members to give the client and the public such service as will be commensurate with the highest standards to be obtained not only in Canada but in other countries. To do this, we must have the complete confidence of the building public, a confidence born of familiarity with our ability to do things as well or better than others can do them. This necessitates not only good architecture on our part, but means the better education of the public concerning the practice of architecture. It means that proper publicity be given the good work that *has* been done and that *can* be done by Canadian architects.

With this object in view, one of the policies undertaken by your Council this past year has been the publicity campaign for a better informed and more sympathetic public with regard to the practice of architecture. There is no need here to go into details of the matter, as it will be dealt with fully in the report of the Publicity Committee, but before concluding my reference to the subject of the promotion of good architecture, I wish to point out that it is so related to our national life as to call for some united effort both on the part of the architect and the public. Our part is, first, to so constitute and organize our offices as will ensure good architecture, suited to our country and national character; secondly, to secure the co-operation and sympathy of the public; and thirdly, by a more active interest in the affairs of our country in such directions as our education and professional training and experience make possible. Governments should be brought to realize that the resources of our country should be conserved for the development of the brain power of this country. Only in this way can we have national character in our architecture.

In connection with the Publicity Campaign the use of the words "registered architect" has played an important part, and in the absence of legislation such as is enjoyed by most of our sister Provincial Associations, the use of the words "registered architect" was deemed desirable as a means of protection to the properly qualified practitioner and to the building public against unqualified practice. It becomes, therefore, the duty of this Association to set and maintain a high standard of practice amongst its members and to attract to its membership the largest proportion of eligible men it is possible to obtain. Let us then so organize our activities that they will draw to us a membership that will make this Association a powerful factor in organized architecture, and one that will fittingly promote and maintain the best standards of architectural practice.

To be effective in this age of organization we must have the interest and loyal support of every member, and any man unwilling to do his share should not remain a member. We want on our register every qualified architect who is willing to work for the common good; no mere hanger on who joins for what he may secure in prestige. It is not sufficient that you elect some of your members to office, for your executive is after all an administrative body, and as such it cannot be expected to transact the business of the organization without the loyal support of a membership that is truly representative of the best in architectural practice. Whilst commenting on the quality of membership, allow me to refer to the growth of our Association. I find on reference to the 1910-11 report of the registrar that in September, 1911, there were 104 members in good standing on our roll. To-day we have about 150 members in good standing on the roll, and a comparison of these figures warrants the question: "Is our membership increasing in a satisfactory manner, and is it sufficiently representative in numbers of the best practitioners of the province?" If not, then I would suggest that some effective means be discussed at this convention whereby the membership may be increased to a point where it might be termed satisfactory and representative, and a membership committee should endeavor to secure the application of the younger men who are eligible; for it is to these we may look with certainty as the coming men who shall take up the torch, so to speak, of those who have served but who shall ultimately be compelled to relinquish.

Referring to the changed conditions of our times, it seems evident that the result has been and will mean changed conditions of practice. For some years, and particularly those since the beginning of the war, there have been many changes affecting the practice of architecture. To quote the recent remarks of a leading practitioner, "Architecture was an Art *or* a Business, to-day it is both an Art *and* a Business," for whilst we are at all times artists we are at the same time master builders whose duties, as the result of modern commercial methods, bring us so intimately into association with every commercial detail, that to conserve the best interests of our clients we must needs be equipped with more business acumen than is necessary in any of the arts allied to ours. Any architect who fails to recognize this rapidly growing condition will find scant recognition for ability when he comes in contact with the hard-fisted client who, while perhaps willing to give a grudging assent to the introduction of certain art features in his building, is more anxious to learn its true rental return.

Architects generally are naturally conservative, and rightly so, but with that conservatism must be sprinkled flexibility, a readiness to adapt themselves to new conditions, while holding fast to those principles and traditions that form the basis of all true art.

Returning to the work undertaken by your Council during the past year, I desire to mention particularly the revision in the schedule of professional charges, and the by-laws. Referring to the schedule of charges, perhaps no profession is less adequately paid for services rendered than architects; no profession assumes a greater responsibility or renders a greater service to society or the individual client. In this connection it has been stated that the estimated net average income of the Architects of Illinois is less than the average net income of Chicago Building Trades Council, and this notwithstanding the many years of study required for the necessary education and training in order to qualify as an architect.

The financial return, even to the most successful in the profession, is not commensurate with the time spent in preparation for the profession and for the services rendered. It would seem that the same concentration of purpose and energy in commercial fields would bring fortunes to most all competent architects. Having in view the changed conditions of architectural practice due to the changed conditions of our times and with ample knowledge of the nature of the services rendered to the client, a committee appointed to deal with this matter, after making an exhaustive survey of the conditions, which included consideration of opinion solicited from a representative number of members of the Association, presented a unanimous report to Council favoring an increase in the schedule. This report was adopted with the result that a revised schedule was issued, which became effective last March.

Referring to the revised by-laws, your Council deemed it necessary to bring the by-laws of the Association up to date, and several revisions were made which in our opinion have been effective and in the best interests of the Association. One of the most important of these was the provision by which the Council has power to drop from membership all those who are in arrears of fees for over one year; the enforcement of which has resulted in the prompt payment of some hundreds of dollars in back fees and the dropping from the register of those members who did not comply with this request. Your Council has thus been enabled to redeem many accounts and to change a situation with regard to non-payment of fees that had become intolerable. Whilst commenting on this matter, I wish to direct your attention to the fact that the past year, as will be shown by the treasurer's report, has been the largest receiving and spending year in the history of the Association. It does not follow that this means a successful Association, as we must judge of success not so much by the financial statement as by the nature and extent of the Association's activities.

Another matter that engaged the attention of your Council was the proposal for the preparation of a comprehensive plan for the Canadian National Exhibition grounds at Toronto. It was felt that some action should be taken with regard to the present arrangement, and after considerable effort we were successful, with the co-operation of other public bodies, in having the Council include in the estimates for the current year a sum of $5,000 to be applied for this purpose. It is the earnest desire of the present executive that the next Council will follow up this matter to a successful conclusion.

The greater use of Canadian building materials has received a great deal of consideration during the year, and we were pleased to note that the Canadian Manufacturers' Association had taken up this matter and had recommended to their members the entrusting of building work in this country to Canadian architects and engineers. A committee of members of the Association had been in conference with the Canadian Manufacturers' Association on these matters with a view to furthering the interests mentioned, and while nothing very tangible has been accomplished, we hope that our members generally will take an active interest in following up this most important question. We as architects should consider it our duty to adopt some policy that will not only increase the use of Canadian building materials, but that will aid in raising the standard of all such materials. Our duty, to my mind, goes farther, for we should encourage and assist in establishing a high standard of workmanship and craftsmanship in all branches of the building industry, for in the days to come we shall see a development that will require the best that is ours to give. Let us see to it, then, that our universities are properly equipped and staffed to produce designers and constructionists, that our technical schools, our industrial concerns and our builders' and trades unions co-operate in training and providing the nation's builders, and let us see that our Governments give us the opportunity for such services and that they shall conserve the resources of the country, in so far as it is possible to do so, for the development by those who as citizens deserve to share in our own growth and prosperity.

We have been patriotic in war, let us be patriotic in peace, encouraging a breadth of view that will keep us on an equality with the leading nations of the world.

I trust that the coming year will be one of prosperity for all members of the profession, and that the opportunity which this convention gives for exchange of opinion will result in benefit to the organization to which we belong.

The Business Conduct of an Architect's Office

Address delivered by A. H. Gregg before recent O.A.A. London Convention.

IN starting a discussion on such an important subject as the Business Conduct of an Architect's Office, it might be well to consider first the general policy which should be established as a basis for all dealings with clients, contractors and staff, and then to consider some of the details of office administration and office system, which may assist in producing good work, and in carrying it out in the most business-like manner.

To begin with, the general policy should be based on the highest standard of ethics. While honorable dealing with all with whom we come in contact is the first essential and the honorable man should have no difficulty in determining the right course to pursue, it might be well to repeat a few basic principles.

First he must be convinced in his own mind that he is qualified to give good service and that there will be no slighting of his duties. An architect cannot be all-wise but if, for instance, his knowledge of heating engineering is deficient he should employ a heating engineer to assist him, rather than to take a chance on a system of his own devising which may or may not be effective.

Another basic principle is that the client's interests demand that the architect be entirely unbiased in any matter in which his judgment is required. It is therefore the invariable rule that no pecuniary advantage accrue to the architect through the employment of any contractor or the use of any special materials. He should not be interested as a stockholder or otherwise in any company manufacturing building materials or have any other business relations that may in any way bias his judgment where the client's interests are concerned.

Another principle that should be enunciated is that while the client's interests are the architect's first consideration, it is equally important that the contractor be given the fairest treatment.

Leaving the strict rulings required in matters of right and wrong, questions of policy often arise, particularly with the younger architects, which deserve consideration. The first of these may naturally be the matter of business getting, particularly as regards the establishment of a practice, and the methods that may be adopted in securing clients. The old idea for the beginner was to trust to one's friends for a start or to enter competitions, where budding genius may hope to be recognized by the public.

Undoubtedly, personality has much to do with the success of a business man or a professional man. A well-educated man, with ability to talk intelligently and entertaingly with any one, a good mixer, such a man has attributes worthy of emulation. At the same time, ability to do is of more importance than ability to talk, and the class of architect who rather glories in his lack of technical knowledge, and who claims the one distinction of being a business getter, usually has a short-lived career. The reason for this is that while he may have associated with him men who can do the work, his own methods are almost inevitably misleading and opposed to the prospective client's interests, as in his efforts to secure work he may mislead him as to the class of building that will suit his requirements, its probable cost, etc., in a way that may not be discovered until too late.

Assuming, however, that the architect is a capable architect there seems no reason why he should not offer his services to any individual or corporation requiring the services of an architect, provided, of course, the field is believed to be clear and no effort is being made to take business from another. It must be remembered, however, that many an architect has hurt his reputation by approaching a man of conservative character, who is instantly antagonized by what he considers an unwarranted effort to forcibly establish business relationship.

In the same way the policy of an architect as regards advertising may be discussed. To my mind an architect has a perfect right to display his name on any building he may be erecting, or he may advertise in the daily papers or by circular or booklet, but the question still arises and must be settled by the individual, are such methods advantageous in the long run?

Group advertising, however, probably makes an appeal to the building public which cannot be obtained by individual advertising, and the campaign recently inaugurated by the Association should have beneficial results for the members generally and should therefore have general support. Such advertising should educate the public as to the services rendered by architects, and thus enlarge their clientele, and it is probably one of the most effective ways of combating the encroachment by contractors, engineers and construction companies on the legitimate field of the architect. Such a propaganda should tend to stabilizing the position of the architect and the service he renders, and with the hard-headed business man it may do much to root out the old idea of the architect as an artistic dilettante, utterly impossible as a man of affairs.

Mention has been made of competition with contractors, engineers, etc., and in this connection I only wish to say a word in passing, as this subject has been pretty fully dealt with at other conventions. From time immemorial, I believe architects have suffered in this way, and if we had the statistics, I believe it could be proved that never has there been such a large proportion of building enterprises of all classes entrusted to trained architects as there is to-day. To make present-day conditions better, I believe the real remedy lies with the architects, who with better and more efficient organizations can prove to the building public that even the most commercial and matter-of-fact buildings should be entrusted to their care. They should see that the architect, who has not interests but the client's to further, who with his all-round training can approach the subject from the artistic, structural and business standpoints, is the man in whom the greatest confidence can be placed. As I have said, I believe the remedy lies with ourselves, but even if at some future period this class of work were entirely lost to architects, trained architects will even then be required for classes of work such as public buildings, fine residences, etc., and if such a condition arise, the architect should then surely be entitled to, and be able to secure, a remuneration for this more difficult work which will enable him to live as well as other professional men.

In regard to the relationship between an architect and his draughtsmen, I should like to emphasize one matter which I believe should receive more and more the attention of architects, and that is the improvement of the status of the draughtsmen.

Under the ordinary system, the draughtsman with ambition, as soon as he believes himself qualified, is desirous of starting off for himself, often to the utter dismay of his chief. Should this be so? If a young man can get business for himself, could not arrangements be made whereby he could continue with his former employer to their mutual advantage? In all large cities do not our law firms work on such a system? It is an interesting study to note the changes that take place in the firm names of large lgeal organizations. Junior partners are constantly being added, some, I believe, on a salary, and some with an interest in the business. The older members of the firm rely more and more on them, and more and more clients find their way to the junior's office, until in good time, the former chief retires and a former assistant takes his place. Such a system cannot of course be made workable in all cases, but what I believe is that a good draughtsman should be given something to look forward to and that with larger and better organizations, many a draughtsman could be saved from a life of drudgery or from the often disastrous effort to start "on his own" in competition with the larger and better known firms.

While dealing with the relationship between the firm and the staff, two other matters might be mentioned, one the matter of overtime and the other that of vacations. While these are matters to be settled by each architect for him self, it seems to me that no harm can be done by general discussion, and as far as possible, having al lour offices run on the same system.

As to overtime, the less the better, and the better the office administration usually the less overtime is required. When it is absolutely necessary to have men working overtime, I believe the general custom is to pay time and a half, this overtime only being allowed, however, when by order of the firm.

As to vacations, the allowance of two weeks' vacation is a common practice, applying to employees who have been in the office for a full year. A "vacation earned" account is sometimes written up on some fixed date, say May 30th, and a proportional vacation allowed for any period of service over six months. If less than six months no vacation is allowed during the season, although the time due may be credited either for future delivery in holidays or in cash.

The internal administration of an architect's office is a subject upon which much thought may well be expended. The many branches of service that are embraced in the practice of architecture to-day demand a carefully thought out system through which clients, contractors and the architect himself will be assured that their several interests are being taken care of in the most economical and efficient manner. It is true than an architect's work cannot be systematized like that of a factory turning out thousands of similar articles day by day and there is no need to crush artistic individuality, but it has been pretty well proven that a well organized office with carried on in a business like manner and with the minimum loss of time and energy, can produce the best artistic as well as utilitarian results. Proper subdivision of work, proper records of all building operations, proper accounting, proper records of office costs, proper filing systems are all essentials, and in the following remarks some suggestions will be made on these subjects as a basis for discussion and comparison.

In the first place, all system introduced should be of the simplest character and suited to the size of the office and to the character of work done. Some very large offices may have many departments—business, designing, draughting, engineering, building supervision, interior decoration, etc., etc.—but for the purposes of this paper we will consider the average office, with say two or three members of the firm and any number up to twenty-five or thirty employees.

As to general administration, it is usually found in such an office that the members of the firm have each developed along structural, designing or business lines, and will naturally oversee these general departments of work accordingly.

In the draughting room a head draughtsman is essential, who will have a general knowledge of all that is going on, will see that all men are kept busy and be the advisor of the other draughtsmen when necessary. Under the head draughtsman different draughtsmen may be made "job captains," a system effectually employed in many moderately sized offices. By this system one man is given general charge of some one building with one or more assistants under him. He has made or knows every drawing connected with that building, occasionally inspects the work in progress and is in a position to answer questions of his chief, the owner or the builder regarding that particular building.

The filing system in an architect's office requires much attention. In our own office, we use a standing file for ⅛" and ¼" scale plans, when desired to keep them flat, boxes 4" x 8" x 24" with flaps at end, and set in cabinet for folded details and pigeon holes for current and old plans when rolled or placed in tubes.

All boxes and pigeon holes are, of course, numbered, and the drawings in each may be instantly found by reference to the "plan file book."

The record of drawings made may conveniently be kept in a loose leaf book with ruled pages having headings giving numbers, "date," "draughtsman," "scale," "to whom delivered," etc. Card indexes are used in some offices, but it seems utterly hopeless to expect a card system to ge kept up properly when different parties have to make entries. Of course if a filing clerk is employed the card indexes may be advantageously adopted, and in this case there will be a separate card for each drawing with full record.

In keeping records of drawings made, it is most important that special entries are made when plans or details are revised, as this is a fruitful cause of trouble. Our rules are that a revised drawing is given the old number with a letter added as 120A, a new entry made and "revised" marked in red ink at the first entry.

In numbering drawings our plan is to give first a building number, then number all ⅛" or ¼" scale drawings from 1 to 100 and all large scale or detail drawings from 101 up.

As to office accounts two sets of books should be kept, one for the personal accounts, dealing with monies actually passing through the architect's hands, and the other for building accounts for which certificates are issued.

For the personal accounts a simple and complete system can be installed with general ledger, cash journal and petty cash books. All cash received should be deposited in the firm's bank account, and all disbursements represented by firm cheques and all these transactions should be recorded in the cash journal which may be classified so that disbursements may be divided by columns into such divisions as office expense, wages, drawing materials, etc., the totals at the end of the month being posted into the ledger.

If a simple double entry system of bookkeeping is adopted, the ledger can be made to show exactly at the end of the year the amount earned, etc. To do this "loss and gain" and a "assets and liabilities" balances are found. In order to determine the assets, it will be necessary to open a special "commissions accrued" account to show amounts earned at the end of the year but not actually received.

To avoid too many cheques and too many entries in the cash journal, a cheque may be issued periodically to the keeper of the petty cash who pays all salaries and makes all petty disbursements which are duly recorded in the petty cash book.

For the building accounts probably the simplest and best method is to have a "building ledger," preferably on the loose leaf system. In such a ledger an account is opened with each contractor, one or more on each page with the building title at the head. The contractor is then credited with the amount of his contract and debited with each certificate issued; the account being duly closed when all entries of extras and deductions are made and final certificate issued.

The keeping of office costs is as necessary in an architect's office as in any other business. To do this every draughtsman should be provided with printed time cards or books, and enter therein the actual time spent on the various buildings from day to day. These cards should be handed into the office weekly or monthly for entry in the "time record" book. In order to complete this record it is necessary to record any time spent by members of the firm in the draughting room which should be noted in their office diaries and duly recorded in the "time record" book.

In addition to draughting room costs, it is of course necessary to ascertain from the office ledger the percentage of overhead expenses—rent, stenographers' salaries, office and draughtsmen's supplies, etc.—to draughtsmen's time.

I might emphasize the necessity of keeping written records of all important matters such as orders for extras, memoranda of important conversations, building reports, etc., etc.

As to building reports, we have found printed forms ruled with headings for "date," "superintendent," "time," and "report" very handy. The current reports are then kept in an alphabetical file hung in the office where any one superintending work may enter his report as soon as he returns to the office.

Another important matter which should be on record is the agreement as to fees, and at the outset of all work there should be a clear written understanding with clients as to the fees to be charged. This understanding may be a formal contract in the case of large undertakings and of necessity when dealing with corporations whose contracts have to be under seal, or in ordinary cases it may be in the form of a letter, with the Association schedule enclosed.

Architecture

By Alexander Harvey, in "Judge."

Architecture is that part of a rich man's home of which he knows the least, although it cost him the most.

A great architect is one who has been dead such a long time that he can be copied with impunity.

A writer must be able to say many offensive things before he can become an authority on architecture.

A school of architecture is a collection of men with the same unintelligible idea.

Queen Anne knew nothing at all about the architecture of her period, in which respect she was no worse off than are the people who chatter about it to-day.

Success in architecture can be achieved only through the medium of an appropriate vocabulary.

A flourishing period of architecture in the past was fostered by the church. A flourishing period of architecture nowadays is fostered by the wives of millionaires.

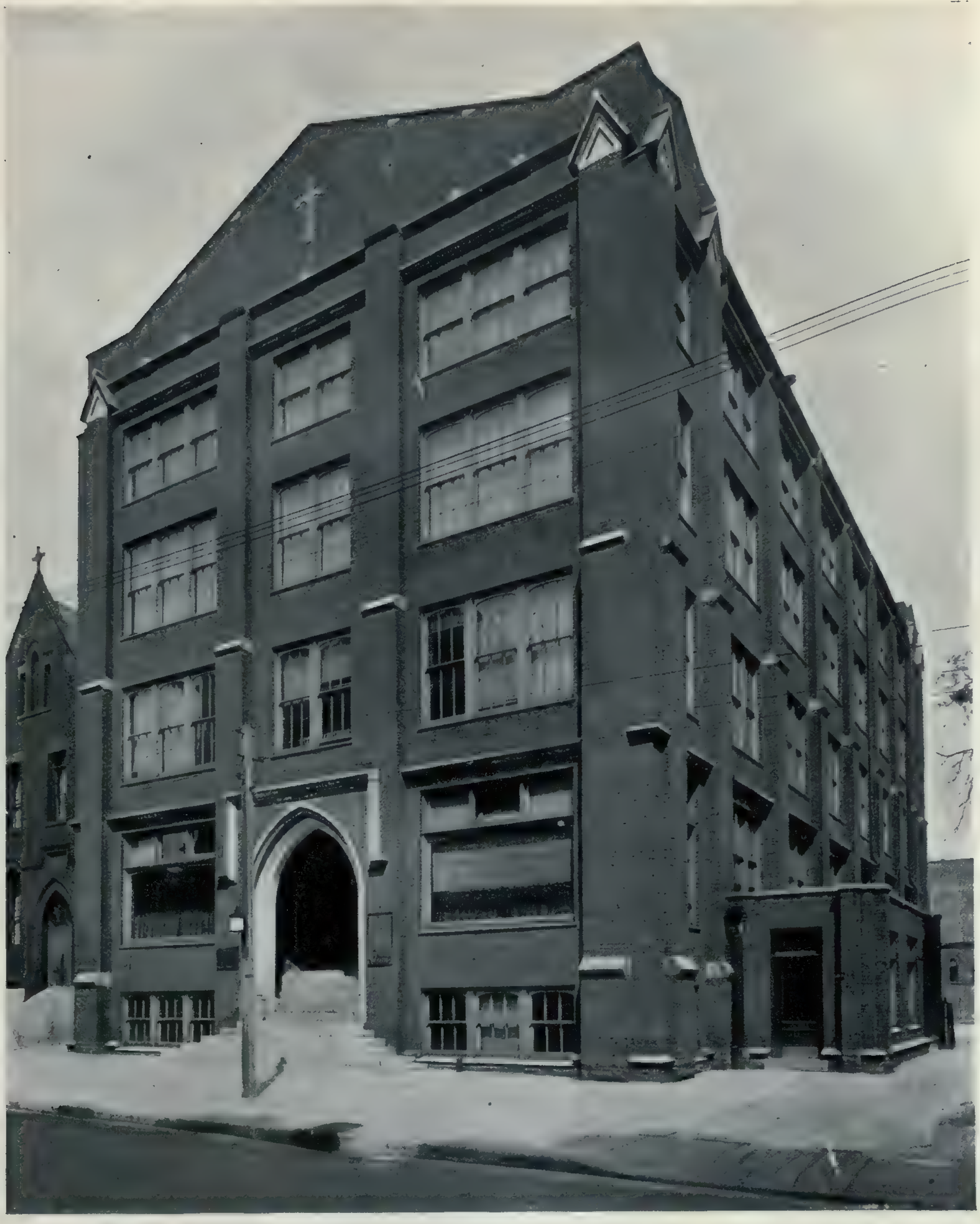
If bad architecture lasts long enough it becomes good.

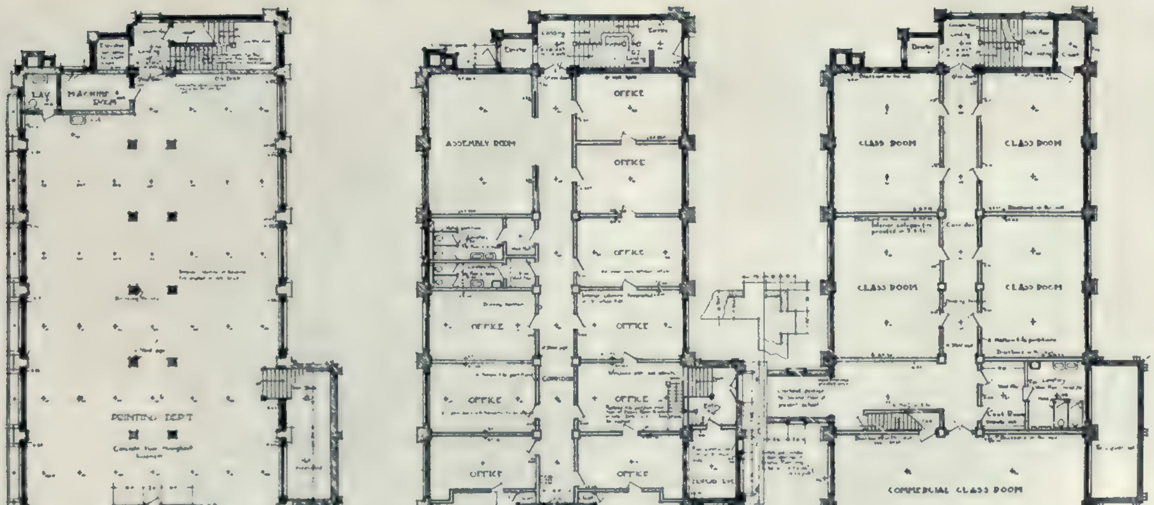
The most devoted lovers of the antique in architecture are the ghosts.

◆

A Giant Floating Crane

The floating crane recently supplied from Great Britain to an Australian dockyard is one of the giant cranes of the world. It is capable of lifting a load of 150 tons and swinging it within a radius of 90 feet. In non-British cranes of this kind the entire weight of the load and the swinging arm is poised on the top of the steel tower which rises from the centre of the pontoon; but in this British design the whole of the dead weight is carried on a large "roller path" fixed to the deck of the pontoon. Dangerous tsresses are thus avoided; material is saved; and the life of the crane prolonged. The crane has been officially tested up to 200 tons with complete success, all the performances calculated for by the builders having been realized. No moving ballast is used in the pontoon, and at no time is the angle of tilt more than about four degrees. Two cranes of a similar type have been at work in the same dockyard for six years. A noteworthy feature of the crane is that, although designed for heavy loads, it handles light loads with ease and rapidity. All the machinery on board is electrically driven, power being obtained from a steam dynamo or from shore by means of a flexible cable.

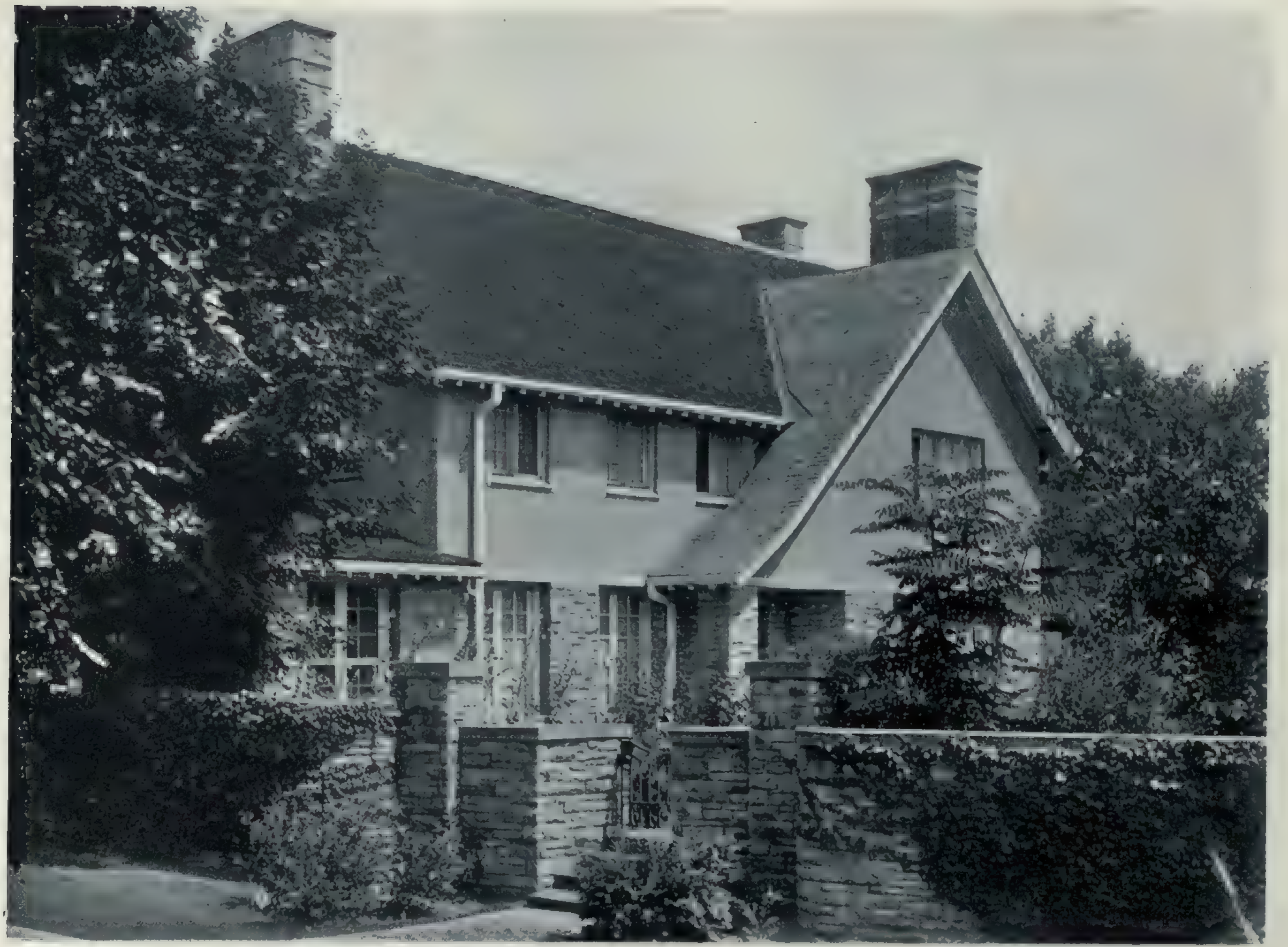


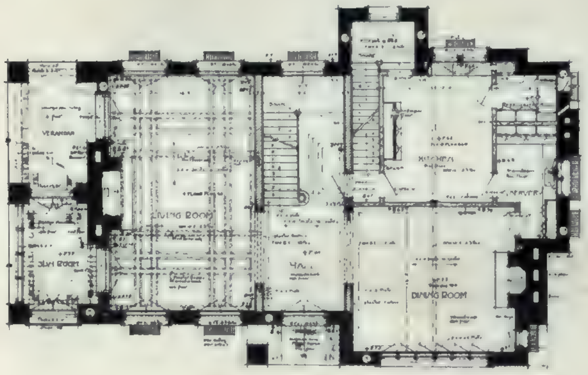


BASEMENT PLAN. FIRST FLOOR PLAN. SECOND FLOOR PLAN.

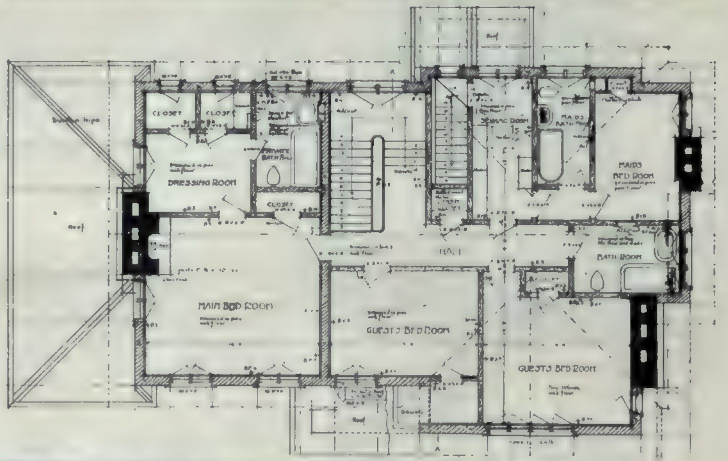
CATHOLIC OFFICE BUILDING, BOND STREET, TORONTO.

PAGE & WARRINGTON, ARCHITECTS.





FIRST FLOOR PLAN.



SECOND FLOOR PLAN.

RESIDENCE OF
J. D. WOODS,
TORONTO.

PAGE & WARRINGTON,
ARCHITECTS.

ENTRANCE DRIVE.

Illustrations

IN the accompanying views are illustrated several interesting subjects representing work of Architects Page & Warrington, Toronto, including three residences, a private tennis house, and an office building for the Catholic dioceses of Toronto.

The latter is situated immediately north of St. Michael's Cathedral, and was somewhat of a problem owing to the widely differing activities for which accommodation had to be provided.

The basement, with unusually large window area, is devoted to a modern printing plant with a private stairway connecting with the printing office and showroom on the floor above.

The first floor is devoted to offices, and the second and third floors are at present used for school purposes, with an overhead bridge giving a direct connection between the second floor and the Separate School immediately north. It is the intention in the future to use these schoolrooms as offices, and they were accordingly planned with that end in view.

The fourth floor is an auditorium giving a clear space the total size of the building without columns or other obstructions, and is provided with a small kitchen and other accommodations.

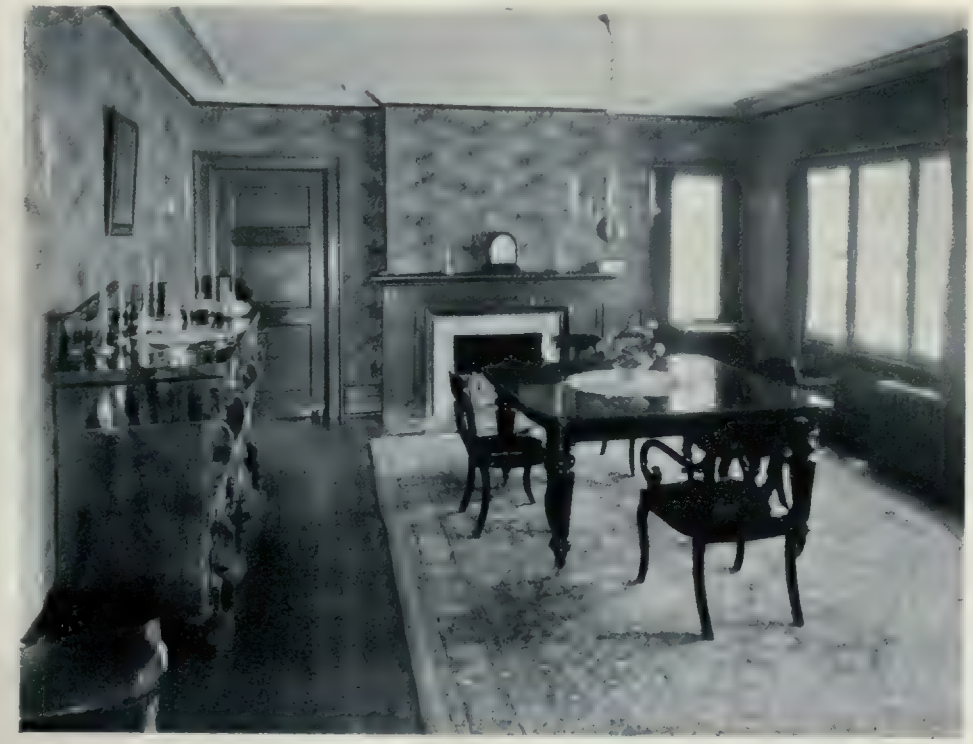
The entire building is of brick with stone trimmings and with reinforced concrete floors, hollow tile partitions and slate roof, making a practically fireproof building. A separately enclosed fireproof stairway and an elevator at the east end give access to all floors.

There is also a tunnel connecting the building with the Cathedral, through which the steam mains are carried from the Cathedral to the office building.

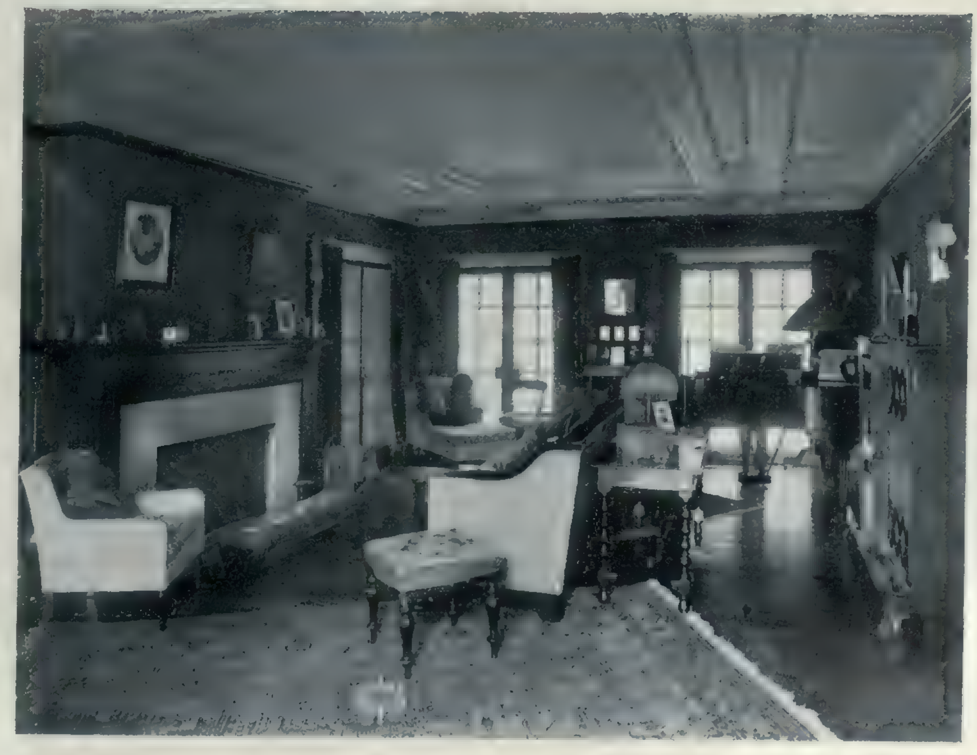
RESIDENCE OF J. D. WOODS, ESQ., TORONTO.

The three residences shown are of quite recent design and are noteworthy both as to character and surroundings. The residence of J. D. Woods, Esq., on Avondale Road, is sited in fairly large grounds, the screen of trees and shrubs making it difficult to obtain a good photograph of the house itself. The construction is of stone with stucco above the first floor and a shingle roof.

It was felt that the materials alone were sufficiently interesting, so that combined with good roof lines and heavy chimneys, it was unneces-



DINING ROOM.



LIVING ROOM. RESIDENCE OF J. D. WOODS, ESQ., TORONTO.

HALL: RESIDENCE OF J. D. WOODS, ESQ., TORONTO.

sary to accentuate any particular feature such as the entrance.

The first floor has a very open plan, all the main rooms connecting with large opening, giving a very spacious effect. The hall runs through the house to a carriage entrance from the drive at the north.

The living room is finished in mahogany with moulded plaster beams at the ceiling. There are no windows in this room, their place being taken by glass doors arranged in pairs. The hall finish is mahogany and white enamel, and the dining room is in walnut, the dining room fireplace having a marble face and hearth which tones with the woodwork in a very pleasing manner.

In addition to the accommodation shown on the second floor, there are three bedrooms and a bathroom in the attic space.

HOUSE FOR MRS. CHARLES CATTO, YORK MILLS.

Mrs. Catto's house is situated in the high land east of Yonge Street at York Mills on the edge of a ravine and is a sturdy appearing, colonial type which seems particularly well suited to its location.

The house is built of red face brick with stone trim, the verandah and porches are of wood with fluted wood columns and all the windows have shutters which show a pleasing detail The detail of the stone heads and sills is noteworthy.

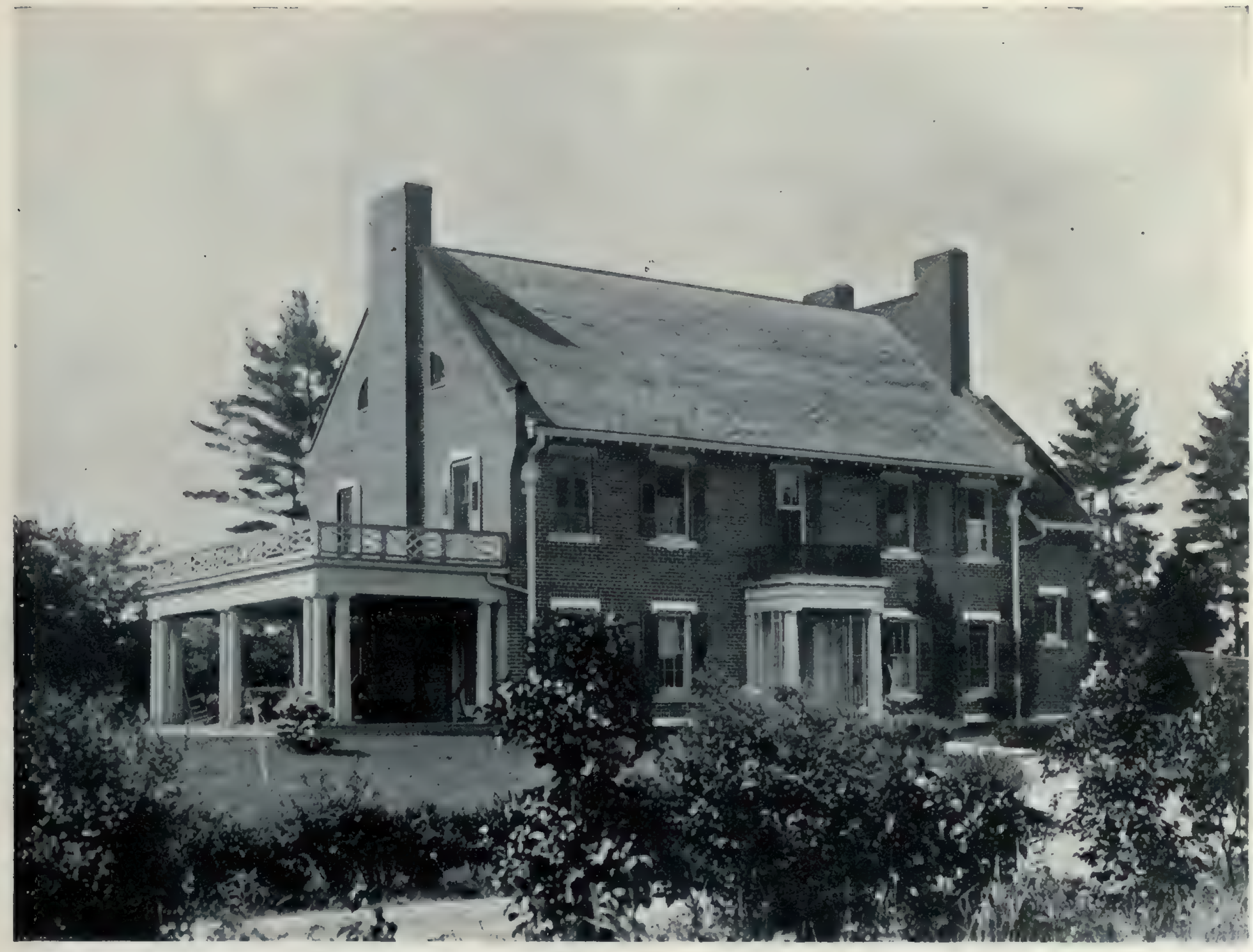
The house inside is finished throughout in white enamel. The schoolroom and playroom at the end of the hall, opening from the garden, is a useful feature in a country house for a large family. The house has its own sewerage and water systems.

TENNIS HOUSE AT LISONALLY FARM, OAKVILLE, FOR SIR FRANK BAILLIE.

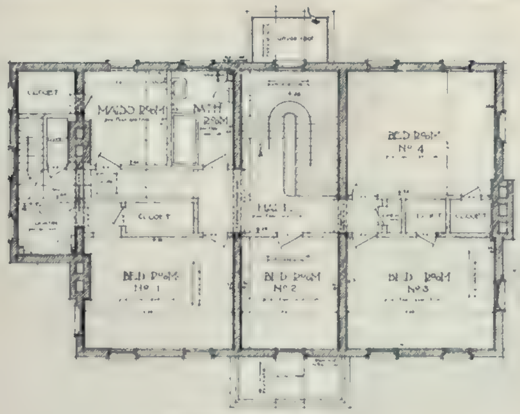
This tennis house is built of frame, with shingle covered walls stained brown and a green shingle roof. The interior walls are of pine sheathing, stained a soft brown and waxed and polished.

The plan shows a centre hall leading through the house and through a covered passageway to a small detached kitchen, electrically

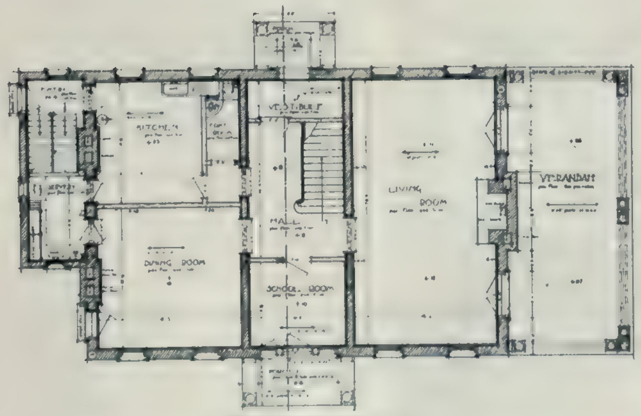
GARDEN ENTRANCE: RESIDENCE OF MRS. CHARLES CATTO, YORK MILLS, ONTARIO.



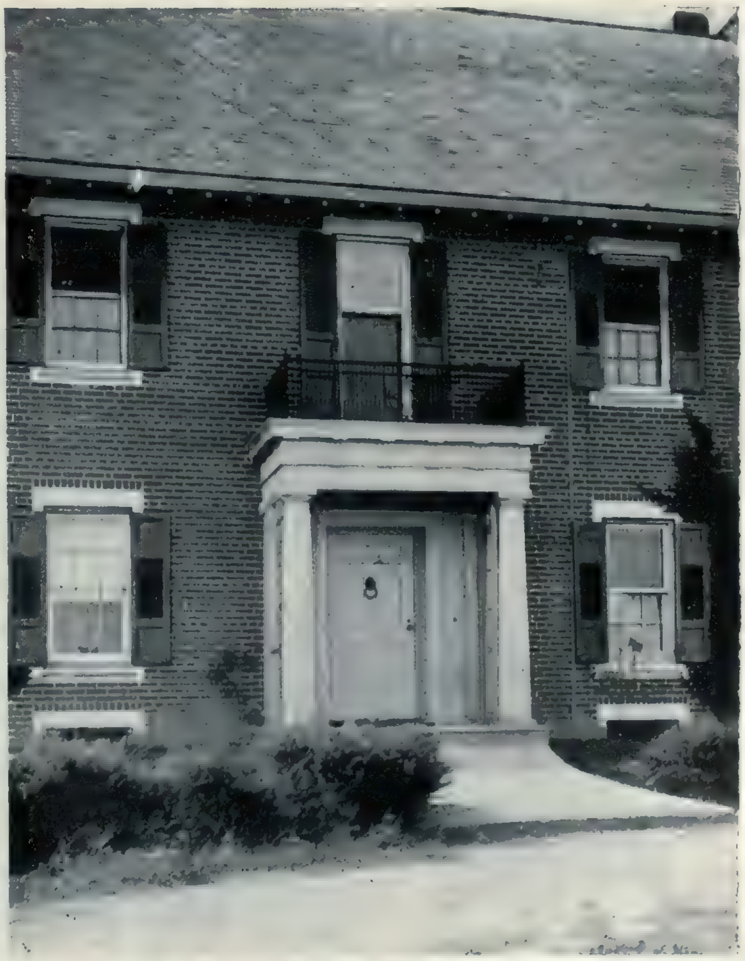
GENERAL VIEW.



UPPER FLOOR PLAN.



GROUND FLOOR PLAN.



DETAIL OF ENTRANCE.

RESIDENCE OF MRS. CHAS. CATTO, YORK MILLS, ONT.

PAGE & WARRINGTON, ARCHITECTS.

DINING ROOM: RESIDENCE OF FORSEY PAGE, TORONTO.

equipped for the preparation of afternoon tea, etc. On one side of the hall are the men's quarters, consisting of a large dressing room, bathroom with enclosed shower bath and two bedrooms. Similar accommodation is provided for the ladies on the opposite side of the hall.

A deep covered verandah overlooks the tennis court and the swimming pool.

RESIDENCE OF FORSEY PAGE, WEBOURNE CRESCENT, LAWRENCE PARK.

The exterior photograph shows an excellent planting scheme which ties the house and the grounds together and blends the whole into a very pleasing composition.

The exterior walls are of hard burned, dark brown brick. The roof is of shingles and the casement windows show leaded glass of good design.

The interior plan is roomy and compact. The hall is finished in mahogany. The dining room is panelled in dark oak, and the living room is finished in fumed oak. A feature of the living room is the large fireplace of outstanding design, carried out in brick and stone with a carved wood panel overmantel.

Douglas Fir or Oregon Pine

(*Continued from page* 271.)

tests proved that Canadian grown and American grown Douglas fir are of practically identical properties.

Some of the examples of the great durability of Douglas fir are to be seen in the numerous large railway trestles which have been in use for long periods, and in some of the ships on the Pacific coast; one, for example, the "Lady Mine," built entirely of Douglas fir in 1879 at Port Ludlow, and still in service between Vancouver and Prince Rupert. The fact that Douglas fir is recognized by the National Board of Fire Underwriters as a proper tank material is an evidence of its durability.

During the war an immense amount of this material found its way into boat and aeroplane construction, the long clear sizes which could be obtained made Douglas fir especially desirable for aeroplane wing beams. Douglas fir is

LIVING ROOM FIRE-PLACE: RESIDENCE OF FORSEY PAGE, TORONTO.

RESIDENCE OF FORSEY PAGE, TORONTO. PAGE & WARRINGTON, ARCHITECTS.

used for all wooden decking, bulkheads and derricks on the new boats of the Canadian merchant marine.

That Douglas fir is popular in the east is shown by the increasing volume of this material which is finding its way into this market. It is specially useful as heavy construction material, and is largely used in mill building construction, an outstanding example of which is the recently completed Hobberlin building on West Adelaide Street, Toronto. This building, in the construction of which 1,000,000 board feet of Douglas fir were used, is seven stories in height and contains 140,000 square feet of floor space. It is claimed in this connection that the insurance rate on a sprinkler equipped mill building is lower than the rate for a fireproof building not sprinklered, and but very little higher than on a sprinklered fireproof building. Needless to say, the timber construction is considerably cheaper.

There are two ways of cutting Douglas fir, one to give edge grained material which is best suited for flooring, decking, stepping, etc., where hard wear has to be taken care of, and the other to give slash grained material which is prized as finish for the effect, in some pieces like watered silk, which is caused by the different colors of the "spring-wood" and "summer-wood" which make up each annual ring or year's growth.

It has been proved that the strength of wood varies with its density or dry weight per unit of volume which in each tree varies with its position in the tree as to cross-section and height in the tree. A stick cut from near the centre of the tree is weaker than a stick cut from near the outside. Also, a piece cut from near the top of a tree is weaker than that cut from near the butt, therefore, the strongest timbers come from the outside of butt logs. Therefore low grade structural timbers, such as railroad ties, often come from near the centre of the log and high grade structural material, such as car sills and aeroplane wing beams, come from near the outside of the log. This latter material is generally clear because of the fact that ordinarily branches grow from the centre or pith of a tree out and as the tree increases in height and the lower branches become shaded they die off, the later wood forming over them being clear and of a high grade. As stated, the strength of a Douglas fir stick is closely related to its density or dry weight per cubic foot. Of two sticks of equal dryness or degree of moisture content the heavier will be the stronger, provided they are of the same grade as regards defects, knots, shakes, diagonal grain, etc. This density may

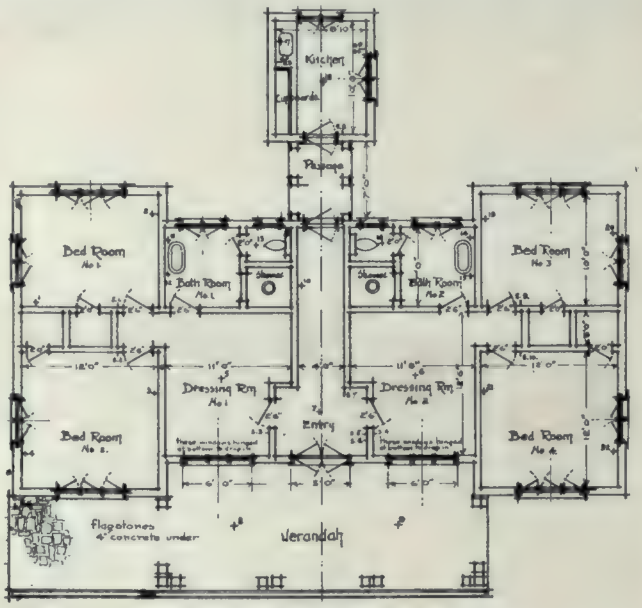
TENNIS HOUSE FOR SIR FRANK BAILLIE, OAKVILLE, ONT. PAGE & WARRINGTON, ARCHITECTS.

be estimated by a visual examination of the amount of the summer-wood in the annual or growth rings. Each year a tree adds an outside layer composed of wood formed early in the year called "spring-wood," and that formed later called "summer-wood." The early wood is composed of comparatively large open thin walled fibres which function as conduits for the passage of sap, the later wood is composed of thick walled elements which give the wood its strength. This wood is darker, more compact and harder, and appears as a dark yellow band. A tree having a large proportion of this wood is heavier and stronger than one having a narrow band of summer-wood and a large percentage of the spring-wood.

"Cross grain" may be due to two causes, diagonal grain or spiral grain. The former is caused by faulty sawing, in that the saw cuts across the layers formed by the annual rings, the latter is due to no fault of manufacture, but to the fact that the wood fibres did not grow parallel with the main axis of the tree, but around it in a spiral. If the degree of diagonal or spiral grain is great, say more than one inch in twenty, the material in which it occurs is materially weakened. The degree of diagonal grain, especially in some sticks, is rather more difficult to detect. It is, however, readily shown on the slash or tangenital face of a stick by the brown resin ducts, or in a dry stick by the season checks which follow the direction of the fibres.

The average oven-dry weight of Douglas fir is approximately thirty pounds per cubic foot; green material approximately thirty-eight pounds per cubic foot, and thoroughly air-dry material approximately thirty-tree pounds per cubic foot. Douglas fir lumber weighs per thousand board feet approximately 3,300 pounds, green, and 2,500 pounds, kiln dry.

The color of Douglas fir varies from red to light yellow. The red fir as a rule contains a high percentage of summer-wood and is slightly more difficult to work. Red and yellow material is often obtained from the same tree, the red from the centre, and the yellow and soft, fine grained material which is formed in the mature tree. Red fir is often from second growth trees. There is no appreciable difference in the strength of red and yellow Douglas fir lumber.



FLOOR PLAN.

Building Blocks Made from Clinkers

A French firm in the Brest district is manufacturing building blocks in which the materials used are sand, lime and cement, with a base of crushed coal clinkers. The advantage claimed for them is their capacity to withstand the humidity of the climate that causes brick walls to drip water on the inside.

The General Relationship of the Contractor and the Architect

An address by President C. Blake Jackson, of the Toronto Builders' Exchange, before the recent London O.A.A. Convention.

You all recognize that contracting and methods of handling contracts have been changing rapidly in recent years. The contractor of twenty years ago was, generally speaking, comparatively a rough type of individual, whose business ability was measured by the forcefulness, fluency and luridness of his language, who was out to make all that he could, and to whom character and reputation were negligible quantities. To-day the modern, successful contractor has a reputation to maintain; a reputation for good workmanship, for integrity, for quick, efficient service; a reputation which means everything to him and to the growth of his business, just as the architect's reputation means everything to him in his profession. The change is one which, I know, the architect himself is glad to note.

When steel buildings came into use, requiring engineering ability together with the necessity of putting up a structure in a given time, it brought with it an entirely different type of contractor, a person whose qualification for success, besides having a practical knowledge of building construction, was organization ability as well as engineering training. Upon the development of reinforced concrete, this change was even more marked, until to-day I know of no large city in the United States where work of importance is not let as a general contract to organizations known as "engineers and builders," "contracting engineers" or "general contractors." In Ontario we have been considerably slower in accepting the general contractor, but there are so many points in his favor that we cannot afford to overlook him in this Province.

GENERAL CONTRACTORS' ASSOCIATION.

Speaking purely as a member of the General Contractors' Association of Toronto, with which Association I had the honor, last year, of being the first chairman, I would like to say a few words on the subject of general contracting.

In the first place, we find in most companies of this kind organizations that are fully equipped to amalgamate all units of your building into one completely finished work. They employ trained engineers as well as the best practical men available who have had special experience in the specific work to be constructed. I might mention here that in the General Contractors' Association of Toronto over seventy per cent. of the executive heads of the firms are university graduates. I might also mention that the accounting systems to-day in most contractors' offices are equal to any other class of business, and as much attention is paid to the purchasing department as is done by any manufacturing or commercial concern.

SPEEDING OF CONSTRUCTION WORK.

There is no doubt about the speed of the construction when the entire work is under the direction of one concern. You probably argue —why cannot the architect secure the same results by acting in the same capacity as the general contractor? Experience has proved that this is an impossibility, for the reason that the architect has not the organization, the facilities for purchasing, the opportunity for rearranging the men or of pushing the subtractors; the latter knowing that if he falls down, the contractor will not hesitate to engage men in that particular trade and purchase materials to complete his work. The subcontractor further knows that the contractor is responsible for the completion of the building in a specified time, and it is a more essential part of his obligation to complete his work as his contract calls for.

Then, another big consideration for your recognizing the general contractor is that he is an invaluable man to give a set of preliminary drawings to some evening about five o'clock when he is looking forward to spending a pleasant evening with his family, telling him that you want an estimate on the cost the following morning. Of course, the pleasant evening is postponed and he proceeds to get out a magnifying glass to try and find one or two dimensions on the drawings, that he may be able to give you, as closely as possible, something tangible to take up with your client.

PAYMENT FOR ESTIMATING.

Some relief to the great amount of estimating done by contractors will soon have to be introduced. In many cities in the United States, contractors are now being paid for their estimates, a small fee, which barely covers the cost. It is either necessary for something like that in this country or to establish a quantity surveying system similar to that which has been used so many years in England. If some such change in our system could be arrived at, I am sure it would materially help to reduce the cost of building. A big portion of any contractor's or sub-contractor's overhead is estimating, and the buildings that are actually constructed are indirectly charged with a portion of that overhead for work that never goes ahead.

The ills of the building contractor are legion, and they have been suffered in silence for many years as more or less necessary evils; but the recent organization of the construction interests offers an opportunity for concerted effort to combat these afflictions, which will assuredly be immediately reflected in the industry.

INSPECTION AND SUPERVISION.

At one stage in the life of the industry—now, fortunately, in the almost forgotten past—the attitude of the general public seemed to be that the contractor was in business for the purpose of putting something over somebody. In no other business or profession is it true that there is a buyer, a seller and a watch-dog. An architect's place in the building world is to plan a building and see that the plan is executed; it should not be to watch for crooked work, to count the sacks of cement used and then accuse of intent. In many cases the builder is at the mercy of the architect's so-called clerk of the works. Usually he has no knowledge of the building construction, and spends most of his time checking the cement going into the mixer. I assure you it is a great joy to the contractor to have on the job an intelligent, practical representative of the architect, and if the owner or the architect cannot afford the services of such a man, it is better for all concerned to have none at all.

SPECIFIC SPECIFICATIONS REQUIRED.

Contractors, unless they are familiar with the practice of the architect or engineer whose plans they are figuring on, are very often under a big disadvantage, owing to the lack of specific detail in the specifications. The specification is a most important instrument, and it is impossible to intelligently interpret the plans unless they state clearly and unmistakably what is expected to complete the contract to the satisfaction of the owner and the architect. Indefinite specifications and sketchy drawings are things to be abhorred. So many specifications are even yet written containing such terms as "wood," "timber," "metal." Such terms are to be avoided.

Also, the lack of information in the specification and the different interpretations put upon that specification is in many cases responsible for the great difference in the tenders of the various contractors figuring on the same job.

This is manifestly unfair to the contractors as well as the owner, and is indeed discrimination in favor of the contractor who has previously completed work from the plans and under the supervision of the architect and is familiar with his practice and standards. Every job has its individual characteristics, and the difficulties to be contended with are seldom, if ever, twice alike. Unfortunately, with some architects it seems to have become the practice to use a stock specification, with but slight additions or variations for every job. The opinion of inspectors as to what constitutes a workmanlike piece of work varies with their experience, and unless the class of work expected is clearly defined, the contractor is very often at the mercy of an impracticable inspector; or where the supervision is limited to the occasional visits of the architect, the owner is at the mercy of an unscrupulous contractor.

Any reputable contractor welcomes an intelligent inspection of the work in progress; it is of great assistance to his building superintendent and avoids costly errors. A clearly defined specification with sufficient details is of the greatest value in avoiding mistakes, and enables the contractor to turn over to a satisfied owner a piece of work that will enhance his reputation and result in increased business.

STANDARD FORM OF CONTRACT.

It is to be regretted that we still have with us forms of contract which are obsolete, as far as the observance is concerned, but which many contractors are still asked to sign. Clauses which read, "that the architect's decision is final and binding on both parties, without appeal," that "all work shown on the plans and specifications is to be carried out by the contractor, as well as everything else not shown on the plans and specifications, but which the architect may deem advisable to go into the work." Such clauses are all nonsense; they are never lived up to and should be deleted entirely to give us a modern working form of contract.

RECOMMENDATIONS FOR BETTERMENT.

The construction business is one full of risks, financially and otherwise, and in days gone by the architect's sole endeavor seemed to have been to throw every risk, without exception, on the shoulders of the contractor. The Associated General Contractors of America have been working steadily on this phase of the situation, and a few months ago brought in a report which makes very interesting reading. The main suggestions put forward by them are as follows:—

1. ACTIONS ON BIDS:—Bids should be submitted with the provision that they must be acted upon within a reasonable time.

2. FREIGHT RATE CHANGES:—Bids should be submitted on the basis of existing freight rates, with the provision that in case a change in rates should occur between the time bids are received and the date fixed for the completion of the contract, the contract price shall be increased accordingly.

3. WAGE SCALE CHANGES:—Bids should be

based and submitted on existing wage rates, with the provision that the contract price shall be increased or decreased in accordance with any change in such rates before the date fixed for the completion of the contract.

4. MATERIAL PRICE CHANGES:—Bids should be submitted on the basis of existing prices for materials f.o.b. the producer's plant or distributor's yard, with the provision that the contract price shall be increased or decreased in accordance with any change in such prices that takes place within the time allowed the contractor to purchase and fabricate his materials.

5. MONTHLY ESTIMATES:—Monthly estimates should include materials delivered and suitably stored as well as materials incorporated in the work.

6. PARTIAL PAYMENTS:—Certificates should be prepared and delivered to the contractor between the first and tenth day of each month, showing the proportionate part of the contract price earned during the preceding month. These certificates should be paid by the owner by the tenth day of the month. Interest on deferred payments should be paid the contractor at the prevailing rate.

7. CONTRACTOR'S RIGHT TO STOP WORK: —Under the following conditions the contractor should have the right to stop work or terminate the contract upon three days written notice to the owner and the architect, and recover from the owner payment for all work executed and any loss sustained upon any plant or material and reasonable profit and damages.

(a) If the work should be stopped under an order of any court, or other public authority, for a period of three months, through no act or fault of the contractor or anyone employed by him.

(b) If the architect or engineer should fail to issue the monthly certificate for payment in accordance with the terms of contract.

(c) If the owner should fail to pay the contractor, within seven days of its maturity and presentation, any sum certified by the architect or engineer or awarded by arbitration.

(d) If the owner does not permit the contractor to proceed with construction within a reasonable time after signing the contract.

8. RETAINED PERCENTAGE: — The retained percentage should be based on 100 per cent. of the work performed and should never exceed 10 per cent. When the amount retained reaches a total sum, which shall be mutually agreed upon by the owner and the contractor, no further reduction from payments should be made.

9. SURETY BOND:—Where a surety bond is given it should be reduced at agreed intervals so as to cover thereafter only that portion of work then incompleted.

10. PENALTY CLAUSES:—Wherever any provision is incorporated in the contract for a penalty against the contractor (including liquidated damages) there shall also be inserted a provision for a bonus of like amount.

11. ACTS OF GOD OR PUBLIC ENEMY:—The contractor should not be held liable for results arising from the acts of God or public enemy.

12. TIME ALLOWED FOR COMPLETION OF WORK:—The time allowed for the completion of the work should be based on "weather working days," instead of on elapsed time, and if necessary, allowance should be made for time spent in performance of unproductive work made necessary by floods or other natural causes beyond the control of the contractor.

13. INSPECTION. — Where practicable, materials should be inspected at the source, so that costly delay may not result from the rejection, at the site of the work, of materials furnished in good faith by the contractor.

14. FORCE ACCOUNT WORK:—Payment for force account work should be made on the basis of the total actual costs of the work, including the actual labor and material costs, rental on equipment, liability insurance, etc., plus a reasonable percentage to cover overhead and profit, total to be not less than 15 per cent.

15. CHANGE IN QUANTITIES:—In case the actual quantities for any item in a unit price contract are less than the estimated quantities by more than a certain fixed per cent., the unit price paid the contractor for that item should be increased by an amount to be agreed upon. Similarly, a decrease in the unit prices should be made in case the quantities are increased over the estimate by more than a certain fixed per cent.

16. ARBITRATION:—In no case should the engineer or architect be made the final judge as to the interpretation of the drawings and specifications, or the performance of the contract. All decisions and interpretations should be subject to prompt arbitration at the choice of either party to the dispute.

ELEMENT OF RISK.

At their meeting it was pointed out that contracting was more or less a gamble, but many have not realized how much of a gamble until someone analyzed the income tax returns and made the following discoveries:—The amount of loss for every dollar of profit made by construction corporations (and this includes building construction) is eight times as great as it is in manufacturing, agriculture or personal service corporations, five times as great as in transportation and public utility corporations, more than three times as great as in mining and quarrying, and nearly twice as great as in banking.

If the contractor could carry out a contract where his financial risk was reduced to a minimum, it would go a long way to reduce the high cost of building.

In Canada the Canadian Cconstruction Industries have been working along the same lines, and a committee is at present in operation which will eventually submit a standard form of contract to cover the whole of Canada; a contract which will be satisfactory to the Association of Canadian Construction Industries, to the Royal Architectural Institute and the Engineering Institute of Canada. It is hoped that this standard form of contract will eliminate in great measure the risks above mentioned, and will give us something which is fair to both.

EXTRAS AND HOLD-BACK.

In talking of the high cost of building, I would like to say a word about that very misunderstood item, "the extras." It may be very hard to convince some architects of the fact, but it is a fact nevertheless, that the "extras" is the bane of the contractor's existence, the rock on which many reputations are ruined and many friendships wrecked, and the element which keeps the lawyers busy and the contractors poor.

Another item which requires careful consideration is the question of the "hold-back" on a straight contract. This matter is still treated very unfairly under a great many contracts, tying up the contractor's capital quite unnecessarily and adding an item of expense to the construction of the building which could very well be avoided.

ACTIVITIES OF CANADIAN ASSOCIATION.

You will doubtless remember when the Minister of Reconstruction started in on his big programme immediately after the armistice, he summoned to Ottawa a conference of manufacturers and builders in the hope that a permanent body would be organized, principally to advise the Government on labor questions and to present the other side of the argument in the same competent way that labor was presenting its side. The outcome of this conference was the birth of the Association of Canadian Construction Industries, and since that date branches of the parent body in Ottawa have been formed all over the Dominion, from St. John, N.B., right out to Calgary. A very successful conference was held in Ottawa last year, and another conference will be held this winter in Winnipeg. A great deal of good work is being done by this Association without much advertising; the executives are in constant session with the Labor Department at Ottawa. Only about ten weeks ago they appeared before the Railway Board on the question of fuel shortage in the cement mills, which has tied up millions of dollars worth of work throughout Western Canada. A few days later they were in conference with the Railway Board again on the question of freight rates, which has a very serious financial relationship to the construction industry. The association and its branches have time and again settled labor disputes, and if you will look back on previous years, and consider the number of strikes that have taken place this year, you will get an idea of the good work that is being done. This association in the past few months straightened out the sales tax tangle for the building industry; they were successful in keeping down the price and at the same time releasing B.C. lumber for the Ontario market. It was also at their suggestion that joint industrial boards have been formed in the larger centres, and which culminated in a National Joint Industrial Board being formed only last month, the chairman of which board to be appointed by the Dominion Government, and toward which an appropriation has been set aside for the work to be carried on.

A standing committee on labor has also been working steadily in an effort to place some real responsibility on labor unions, to further the apprenticeship system, technical education, classification of workmen and standardization of wages They are also conferring with the Government on the question of immigration of labor.

All of this work helps the building industry, and thereby helps the architect, and we would ask the moral and active support of the Ontario Association of Architects.

TORONTO BUILDERS' EXCHANGE.

The Builders' Exchange of Toronto is deserving of a word in passing, just to give some idea of what our organization is aiming at. At the present time we are going through a state of re-organization. It is our intention to go so far as to change the name of our organization, so as to increase its scope and prestige. About two months ago a business manager was engaged and a new constitution and by-laws are now being drafted with a view to consolidating the entire building industry of the city of Toronto. In this connection, I would just like to read a few paragraphs from the proposed constitution and code of practice so as to give you some idea of what this organization means to the building industry of the city.

CODE OF PRACTICE.

1. In order to avoid misunderstandings all agreements should be in writing.

2. Proposals should be made subject to the conditions and terms as outlined in a standard contract form, no modifications of changes should be made in the contract which would interfere with the rights of contracting parties.

3. Members should be given the preference in competing for, and in the award of business.

4. Members should regard and respect the interests of the architectural and engineering porfessions.

5. Any attempt to discredit the integrity or injure the business reputation of fellow members, either directly or indirectly should be discouraged; divulging information in such a manner as to result in endangering the prospects or supplanting a member is considered an unfair practice.

6. When the proposal of a solicited bidder is used in compiling the cost, or to serve as a basis for general figures, or revision, said bidder should be awarded the work.

7. A bidder being offered a contract in accordance with his proposal and the provisions of the code of practice should accept it and do the work. Members should execute their work in strict accordance with the agreement and the plans and specifications. Any attempt to evade responsibility, or substitute material for that called for in the agreement without the consent of the other party to the agreement, is considered bad practice and should be discouraged.

8. Naming of unit prices in original bids to serve the purpose of computing cost of additions or allowances for deduction should be discontinued. Where additions or deductions are contemplated they should constitute separate transactions.

9. In no instance should payment be made for the use of plans in erecting work, or any changes be made under the contract, either specific or pro-rated, unless they are particularly mentioned in the specifications or in the tender form.

10. Members should recognize the necessity of short credit terms and the elimination of credit risks. Pay-

(*Concluded on page* 300.)

CONSTRUCTION

A · JOURNAL · FOR · THE ARCHITECTURAL
ENGINEERING · AND · CONTRACTING
INTERESTS · OF · CANADA

H. GAGNIER, LIMITED, PUBLISHERS
Corner Richmond and Sheppard Streets.
TORONTO - - - - CANADA

M. B. TOUTLOFF, Editor
W. H. HEWITT, Advertising Manager.

BRANCH OFFICES:
MONTREAL—171 St. James Street,
E. R. Milling, Representative.
WINNIPEG—336 Qu'Appelle Street,
F. C. Pickwell, Representative.
NEW YORK—505 Fifth Avenue.
H. M. Bradley, Representative.

CORRESPONDENCE.—All correspondence should be addressed to "CONSTRUCTION," Corner Richmond and Sheppard Streets, Toronto, Canada.

SUBSCRIPTIONS.—Canada and Great Britain, $3.00 per annum. United States, the Continent and all Postal Union countries, $4.00 per annum, in advance. **Single copies, 50c.**

ADVERTISEMENTS.—Changes of, or new advertisements must reach the Head Office not later than the twentieth of the month preceding publication to ensure insertion. Mailing date is on the tenth of each month. Advertising rates on application.

CONTRIBUTIONS.—The Editor will be glad to consider contributions dealing with matters of general interest to the readers of this Journal. When payment is desired, this fact should be stated. We are always glad to receive the loan of photographs and plans of interesting Canadian work. The originals will be carefully preserved and returned.

Entered as Second Class Matter in the Post Office at Toronto, Canada.

Vol. XIII. Toronto, Sept, 1920 No. 9

The R. A. I. C. Call

The official announcement of the General Annual Assembly of the Royal Architectural Institute of Canada to be held at Ottawa, October 1 and 2, stresses the point that "every Canadian architect is expected to be present." It is at least to be hoped that the attendance will in every way be representative of the importance of the Institute and the very worthy objects it is endeavoring to further. Following almost immediately on the heels of the successful meeting at London of the Ontario Association, the assembly will undoubtedly enlarge on a number of questions discussed at the time, and take steps tending to greatly broaden the scope of association activities in the various provinces.

Supplemental to the programme which has been sent out, it is announced Mr. Charles Harris Whitaker of the American Institute of Architects, Washington, D.C., will speak on "Development affecting the Practice of Architecture in the United States," "The Congress of the Building Industry of Chicago," "The Post-War Committee of the A. I. A.," and "The General Tendencies which have paralyzed the Building Industry."

Mr. Eric Brown of Ottawa, Director of the National Art Gallery of Canada, will also deliver a talk, his subject being "Canadian Art and the Canadian Art Gallery." Other speakers will be Mr. Percy E. Nobbs, who will discuss "War Memorials," and President J. P. Anglin, of the Canadian Building and Construction Industries, who will speak on "Labor and the Building Industries."

Not only is the programme in general an attractive one, but the issues to be discussed lie very close to the interests of all architects today.

Besides this the Ottawa architects have organized an architectural exhibition in connection with the Assembly. Among the exhibits there will be some interesting subjects from the Department of Public Works, as well as a number of drawings of the new Parliament Buildings. An interesting collection of drawings and photographs on housing will also be shown.

◆

Housing Progress in Ontario

According to information made available by the Railway and Municipal Board, the end of the year will have seen about 2,200 houses erected in Ontario under the Ontario Housing Act, 1919. During last year 1,184 houses were erected and 1,000 have been erected or are in course of erection in 1920. The total costs of these houses and the land on which they were built is approximately $8,800,000. The persons who have received loans have contributed toward the cost of the houses over one million dollars. About two-thirds of the houses have been erected on lots already owned by the persons building. Ontario leads the Dominion in the matter of municipally and Provincially assisted housing.

The foregoing, however, does not apply to Toronto where little progress has been made in housing despite the fact that accommodations are badly needed; and as this issue goes to press the Board of Control is again proposing a home building programme and have sent on for confirmation by the Council the names of E. L. Cousins of the Toronto Board, John T. Russell, shipbuilder; W. H. Smith, Chairman Social Service Commission; Geo. Barron, merchant, and Lt.-Col. Boyd Magee to constitute a new Commission.

The proposal is to erect 500 houses of a cheaper class than was formerly erected by the Housing Commission to be sold or rented to those who have been residents of the city for two years and to loan bona fide builders (not speculators) an advance of $1,000.

General Relationship of Contractor and Architect

(*Continued from page* 298.)

ments should be made in strict accordance with the terms of the agreement. In case circumstance make inevitable the deferring of a payment when due, the other party to the agreement should be notified before due date. Prompt payment of accounts should not be dependent upon the completion of the project as a whole.

11. The rights of contracting parties should be fully recognized in the matter of disputed accounts and unsettled claims. To avoid confliction no other members should knowingly engage in the work under dispute until such dispute or claim has been satisfactorily adjusted.

12. Any violation of the provisions of this code should be reported in writing to the business manager of the Builders' Exchange, who will report such violation to the Arbitration or Grievance Committee, who will proceed to investigate the report. Every opportunity should be given the accused party to refute the charges. The finding of the committee shall be given full publication by bulletin to the members.

13. Members should regard the making of a profit as being necessary to their remaining in business. Every effort should be exercised in fully covering the quantities and the cost of labor, materials and overhead that enter into the work. It is recommended that all members adopt a practical system of estimating and cost accounting.

AIMS AND OBJECTS

1. To protect and encourage the building and construction industry of the City of Toronto and the County of York.

2. To foster the growth and progress of the city by promoting the erection of well planned, properly constructed and equipped public and private buildings.

3. To inculcate just and equitable principles of dealing with contractors, sub-contractors, architects, engineers and manufacturers and dealers in building and construction materials, to the end that membership in this association shall be a reasonable assurance of skill, honorable reputation and reliability.

4. To acquire, preserve and disseminate business information.

5. To avoid and adjust, as far as practicable, the controversies, misunderstandings and difficulties liable to occur among persons engaged in the building and construction trades.

6. To establish and maintain a central office and headquarters with facilities for ease and convenience in the transaction of business as well as for conferences between memebrs of the trade and kindred organizations.

7. To establish trade schools and promote technical education, manual training and general welfare of the artizans of the community, as well as the recognition of good workmanship, fidelity and the rights of labor.

8. To provide a means of acquaintance, both personal and business, among the members, and to promote good feeling and harmony among those engaged in the building and construction industry.

9. To endeavor to enlarge the business views of those who may become members.

10. To promote mechanical and industrial industries, and to establish and maintain uniformity in commercial usages.

11. To reform abuses in trade or business. To secure freedom from unjust or unlawful exactions. To diffuse accurate and reliable information among the members as to the standing of merchants and builders, and other matters. To produce uniformity and certainty in the customs and usages of trade and commerce, and of those engaged in the building or construction industry, or the furnishing materials thereto.

You will see at once that this organization is far from being a price fixing affair. There are many problems to be solved in the building industry that means much to the architectural profession, and it would be only fitting that the Toronto branch of your association take out a membership card in our new organization.

ORGANIZATION NECESSARY.

Co-operation is necessary in any industry. I think it was Benjamin Franklin who said, "We must all hang together, or assuredly shall we all hang separately." I am of the firm belief that closer co-operation and understanding with the contractor and more appreciation of his position would save money for your client, give him better work, be more satisfactory to you, and certainly make life smoother for the contractor.

The advantages of organization are entirely obvious, the weakness of any professional or trade association is in the outsiders; when there is thorough co-operation wonders can be effected in the solution of legal, political and commercial difficulties which exist at the present time. There is the question of high cost of labor and materials, transportation, foreign competition, unfair home competition, and a host of other problems of vital interest to the architect, engineer and building contractor, which can only be solved by united action, and thus raise the standard of construction work in Canada. Mutual assistance has been used with such beneficial results by manufacturers, doctors, business men, etc., that the results of organization are apparent beyond all question.

CO-OPERATION NECESSARY.

The art of the architect and the craft of the builder are combined in the development of the colossal building industry of to-day. When we realize how necessary the one profession is to the other, does it not seem remarkable that it is only of comparatively recent years that any attempt has been made to establish a close bond of union and spirit of co-operation in these professions?

There is a question that I have asked architects at various times and have never received a satisfactory answer. "Why have we no compulsory registration of architects in the Province of Ontario?" I do not know whether or not you realize that a movement of this kind would receive the hearty co-operation of practically all contractors and exchanges throughout the province. The paragraphs I have just read to you of our proposed new constitution, as well as my general remarks, show you that we are eager to back any movement for the betterment of building conditions in both the province and Dominion. We suffer more than you

CONSTRUCTION

October, 1920 Volume XIII., No. 10

CONTENTS

INTER-ALLIED TOWN PLANNING AND HOUSING CONGRESS OF 1920.... 303
By W. D. Cromarty.

R.A.I.C. ASSEMBLY, OTTAWA 310

LABOR IN THE BUILDING INDUSTRY 312
An address by President J. P. Anglin of the Association of Canadian Building and Construction Industries before the R.A.I.C. Assembly.

PREMISES OF PRINCES' LIMITED, TORONTO 317

ADAMS FURNITURE COMPANY'S BUILDING, TORONTO 321

NEW HOBBERLIN BUILDING, TORONTO 323

POST WAR ARCHITECTURAL AND BUILDING PROBLEMS 324
An address by Charles H. Whittaker of the American Institute of Architects, before the R.A.I.C. Assembly.

O. A. A. NOTES 329

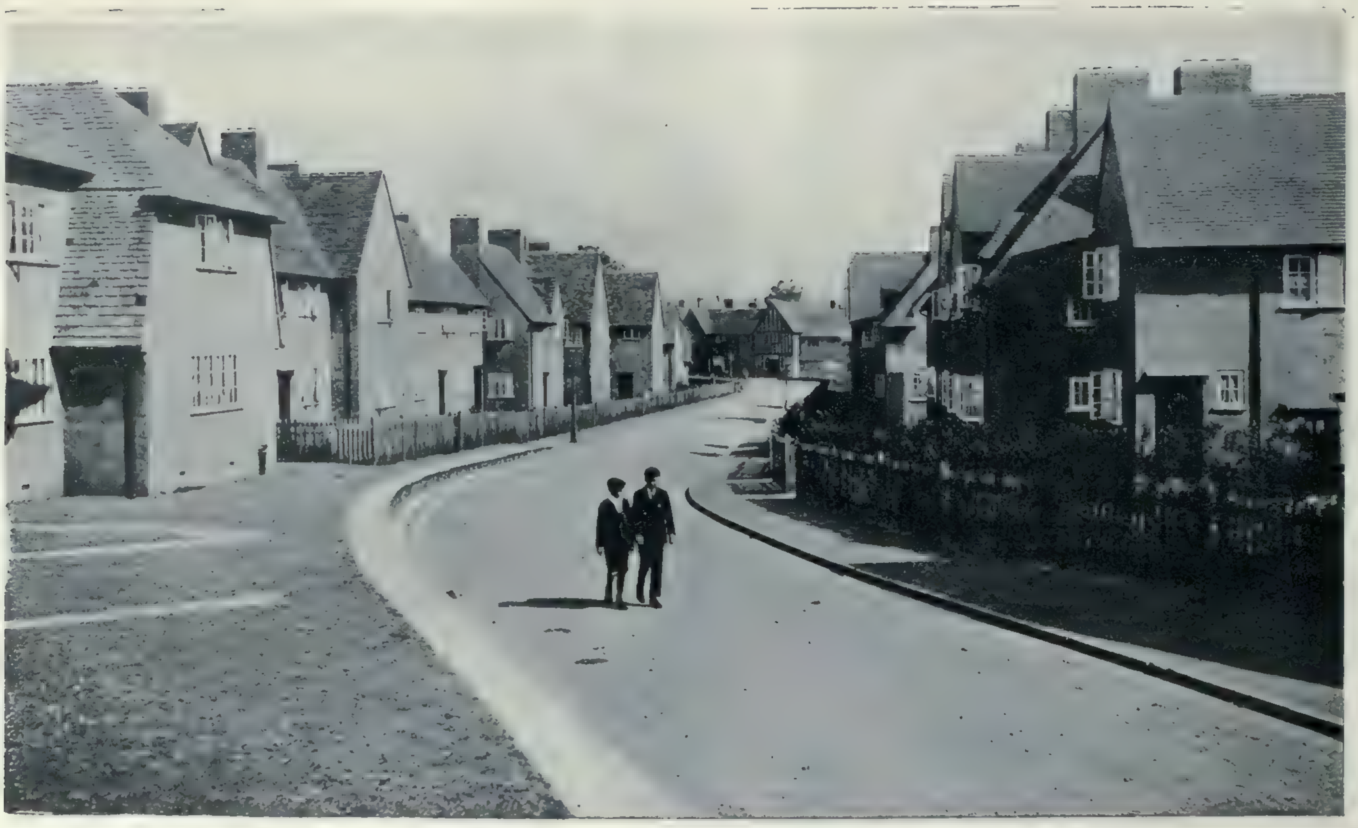
SYNOPSIS OF CAUCHON REPORT ON RAILWAY SITUATION IN LONDON. ONTARIO 333

EDITORIAL 335

Frontispiece

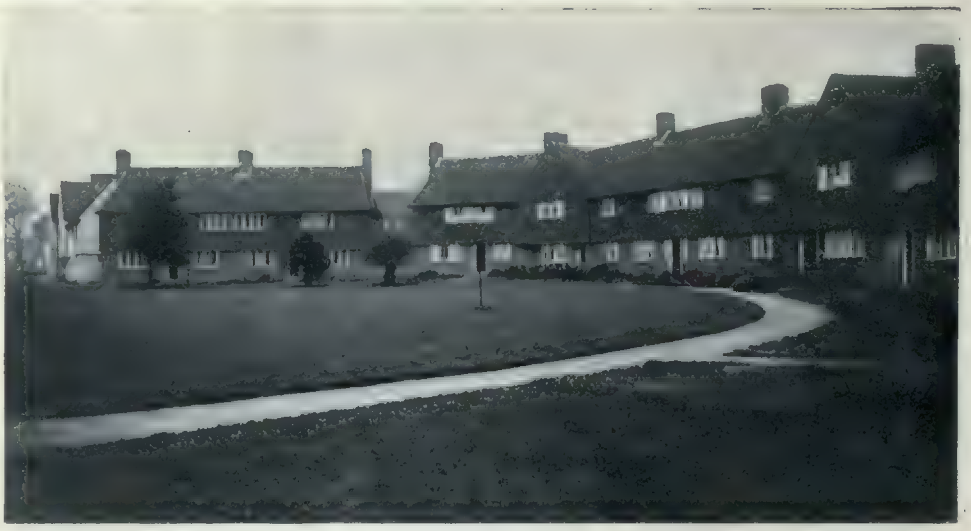
MINISTRY OF MUNITIONS' HOUSING SCHEME, WELL HALL, WOOLWICH, ENGLAND 302

H. GAGNIER, Limited, Publishers
GRAPHIC ARTS BLDG., TORONTO, CANADA
BRANCH OFFICES
MONTREAL NEW YORK

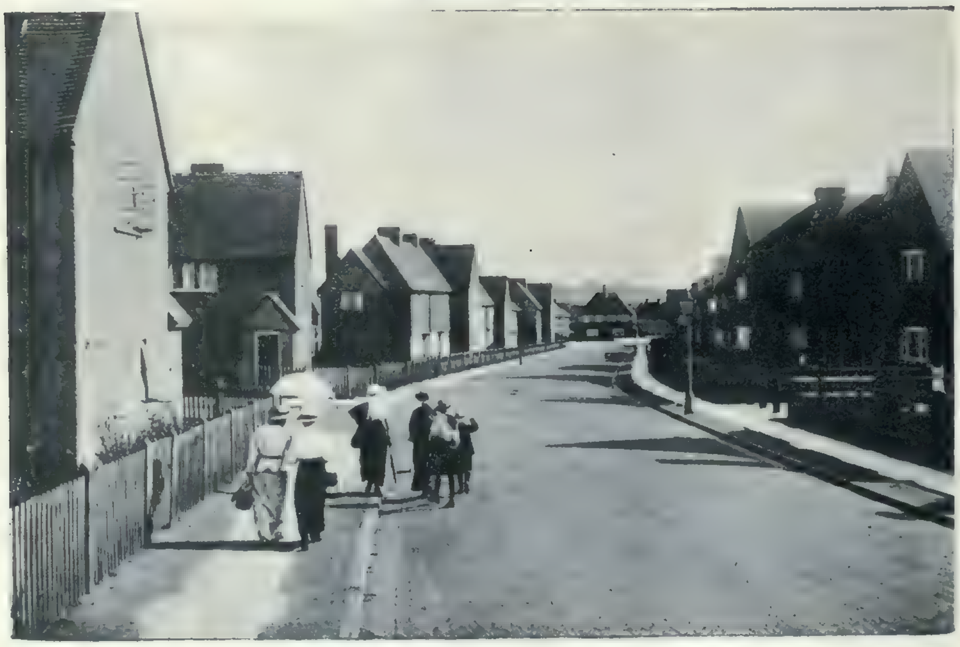


"ROSS WAY," LOOKING EAST, 1915

MINISTRY OF MUNITIONS
HOUSING SCHEME.
WELL HALL.
WOOLWICH, ENGLAND.



CRESCENT, NEAR STATION.



"ARSENAL ROAD,"
LOOKING WEST, 1915.

"OLD OAK," LONDON COUNTY COUNCIL DEVELOPMENT.

Inter-Allied Housing and Town Planning Congress of 1920

By W. D. Cromarty.

Address delivered before the recent London Convention of the Ontario Association of Architects.

THE business of the Inter-Allied Housing and Town Planning Conference was divided into two parts, the formal proceedings and discussions and the series of visits made to various housing projects.

The formal proceedings were held in the Central Hall at Westminster almost under the shadow of Westminster Abbey on Thursday and Friday, June 3rd and 4th. In the week following the delegates made journeys in the neighborhood of London and as far afield as Bristol and Birmingham, visiting both pre-war and post-war housing schemes.

At the opening session some 700 delegates were in attendance, twenty nations being represented. France had 35 delegates, Norway 45, Holland 50, Finland 53, Belgium 25, Spain 20, Denmark 20, the United States 6. In addition, among others, the following countries had representatives—Canada, Australia, New Zealand, Cape Colony, Egypt, Italy, Switzerland, Roumania, Japan and Siam. Dr. Addison, the Minister of Health, presided, and after welcoming the delegates and outlining the business of the Conference, he stated that he thought it fortunate and indeed significant that one of the first international meetings after the conclusion of peace should be assembled to discuss housing.

Short addresses were also delivered by the delegates other than those of Great Britain, including the Spanish Ambassador, M. Merry del Val, a brother of Cardinal Merry del Val; M. Sellier, a French delegate; Mr. Thomas Adams, representing Canada; Mr. Veiller of the National Housing Association of the United States, and Dr. Royal Copland of New York.

The presiding officers of the subsequent sessions were in turn: the Minister of Health for France; Mr. Robert Munro, Secretary for Scotland; and Lord Astor, Under-Secretary of the Ministry of Health.

The conference, at the first session, passed a resolution to this effect:

> That, in the opinion of this Congress, legislative action in the preparation of a National Housing Policy should be taken by each Government (with wherever necessary special financial provisions relative thereto), such programme to be carried into effect on lines of co-operation between the Government on one hand and local authorities and other agencies—including private enterprise—on the other.

TYPE OF FACTORY: PLENTY OF LIGHT, PLENTY OF ROOM, GARDEN SURROUNDINGS. WORKERS LIVE FEW MINUTES WALK AWAY.

A BACK YARD THREE YEARS OLD: PAIR OF HOUSES, SOLLERSHOT, WEST

MEADOW WAY.

VIEWS OF LETCHWORTH.

LETCHWORTH: BACK GARDENS OF WORKMEN'S HOMES.

> Further, this Congress is of opinion that such a housing policy should be sufficient in its scope and character to secure that within the limit of twenty years every family shall be housed under proper conditions with adequate provision for amenity in regard to surroundings.

At the afternoon session on Friday, the following resolution relating chiefly to town planning was passed:

> (1) That in order to secure adequate provision of air and light in and around the homes of the people there should be definite limitation of the number of dwellings per hectare and for space adjacent to dwellings, such limitation being a matter of Governmental determination in each country.
>
> (2) That the policy of decentralization of industries and the building of new garden cities should be encouraged by legislative provisions and by all other means, both public and private.
>
> (3) That each Government, acting in partnership with local authorities, should prepare in advance and carry into effect a regional survey, followed by planning schemes, with a view to putting an end to wasteful and chaotic developments and securing that the lines of future growth shall be well ordered and scientific.
>
> (4) That in view of the acknowledged necessity of such action the Government should, acting in co-operation with local authorities, control the direction and assist in the upkeep of main and arterial roads.

One of the great benefits of such a congress is the opportunities it affords of talking over problems and conditions with men from other lands. Such opportunities were many, occurring now and then in the corridors of the Central Hall at a time when some eloquent gentlemen pleaded in the meeting for his particular and generally impossible fad. Chiefly, however, the opportunities occurred during our visits around the country. I found men from France, Norway, Sweden and even as far afield as Egypt, who had visited Canada and who, retaining pleasant impressions, were anxious to know of what we were doing here. I told them modestly, I trust, of the things we had done and of what we hoped to accomplish.

On behalf of the British Government, Sir Alfred Mond, H.M. Commissioner of Works, invited the delegates to a garden party at Hampton Court on the afternoon of June 7th. The delegates were received by Dr. Addison, the Minister of Health. It was a wonderful June day of soft sunshine. The lawns and flowers and splashing fountains dominated by the grey old buildings with the vivid memories of kings and princes and cardinals made an impression I shall not soon forget.

On Thursday, June 10th, H.M. King George V. received a deputation from the Congress at Buckingham Palace. The deputation consisted of two delegates from each country represented. Mr. Thomas Adams and myself as Canadian representatives were included in the deputation and were presented to the King. I derived a certain amount of quiet amusement when on hailing a taxi, the driver asked me "where to." I murmured Buckingham Palace, managing, I think, to convey the impression that I lived there.

In connection with the Congress I paid visits

LETCHWORTH: GARDEN CITY AGRICULTURAL BELT.

siderable number of housing schemes. I shall have to confine myself briefly to three of them, with some reference to the newer materials and types of construction being used at others. The three are Well Hall, Letchworth and Hampstead. At Well Hall, Sir Frank Baines, the chief architect of the office of works received the delegates. The Well Hall scheme was a direct outcome of the war, the town being built for the Ministry of Munitions in 1915. The whole of the work of building up an area of 96 acres with permanent houses, occupied less than a year from start to finish. There is, however, no suggestion of hurry or scamped labor anywhere, and the houses wear an air of comfortable prosperity, and the whole scheme is pleasant to look upon, although the design in general errs on the picturesque side. The open spaces are of considerable area with a reasonable allowance of garden space to each house, the average garden being about 1,100 square feet. All the roads are gravelled, the secondary sidewalks also are gravelled, the more frequented ones having concrete slabs down the centre. The roads are 40 feet and 30 feet wide according to the amount of traffic passing over them. The names of the roads recall personages who have been connected with the Arsenal and the town of Woolwich. The total number of houses and apartments provided is 1,298, thus making provision for a population of about 6,500.

In certain of the houses the rooms were too small. I spoke to several of the tenants, two living in houses without parlors expressed a preference for an ordinary fireplace in the living room with the range in the scullery. This would constitute an arrangement similar to the small Canadian house with a living room and a modest kitchen. The bath-tub in some of the houses is in the scullery. This would seem to be fatal to cleanliness, as the cover over the bath-tub becomes a shelf, necessitating the removal of a large variety of articles prior to bathing. In most of the newer developments in England, the bath-tub is in a definite bathroom and is generally on the upper floor.

The absence of street trees is very noticeable, and mars the effect of the otherwise attractive streets.

The reason for this is, of course, that the work was undertaken at a time of great national stress when the lesser things had to be set aside. Trees will, I have no doubt, be planted later and the added charm resultant from their presence obtained.

"HAMPSTEAD WAY," HAMPSTEAD GARDEN SUBURB.

Letchworth.—This, the first Garden City, is situated about 30 miles from London, and owes its being to the Garden City Association which was formed to bring before the public the principles advocated by Mr. Ebenezer Howard. The garden city movement seeks to make us ashamed of our ugly, unhealthy cities, and to advance principles by which their worst evils may be abolished or at least reduced to a minimum in the planning of new cities. The English countryside is very beautiful, but many of the larger cities are depressingly unlovely. Thoughtful town planning in years past would have obviated this. Letchworth is now a town of some 13,000 people with sixty factories and workshops, carrying on under conditions favorable to the health of the workpeople.

The general effect of Letchworth is one of much charm. In detail one is disappointed at the lack of interest displayed in the gardens of the smaller houses. This is no doubt accounted for by the fact that the occupants of these houses were previously dwellers in large cities where gardens for the worker were unknown. It is the next generation that will benefit most completely by their new environment.

I went carefully over the houses now being built at Letchworth. In spite of the vastly increased cost (pre-war £200, post-war approximately £1,000), they do not possess the charm of the earlier houses. A Spartanlike simplicity is now aimed at, and while one appreciates this as a general motive, there is no denying that the occasional introduction of gables and long roof lines, for example, does add to the appealing quality of a scheme.

The main principles of the garden city movement may be thus classified:

1. Constructive—by the erection of new houses in undeveloped areas.
2. Provision for both industries and residences.
3. To procure the unearned increment for the community.

As the official handbook of the First Garden City Company puts it: "The essence of the idea lies in the principle of beginning at the beginning. Instead of allowing houses to be run up here and there, one block or one street quite irrespective of the position of another, drainage and water system being introduced piecemeal, as best they can—the whole city which is to be should be planned out from the outset with an eye to the convenience of the community as a whole."

For good or ill the people of Great Britain are a manufacturing people, and the Garden City recognizes this economic fact as it also recognizes the prevailing tendency of manufacturing industries to migrate from large centres of population to rural districts—a tendency, by the way, that is prevalent in Canada at present.

Letchworth has been an undoubted success, 3,800 acres were bought at $200 an acre. The promoters planned the site of the city. They put in an electrical installation, gas works and a pure water supply. They prescribed that there should not be more than seven or eight houses to the acre. All the industries were put in one part of the estate where the prevailing winds would take the smoke away from the town. The worker in Letchworth lives within a few minutes' walk of his place of employment. No costly transportation system takes him to a point ten miles or so out in a suburb to a plant in the centre of the city requiring him to spend two or three hours a day in going to and fro from his work.

It was decided to maintain control of the land in perpetuity for the benefit of the people. The so-called unearned increment is conserved for the benefit of those who create it. The land, as I have said, was bought for $200 an acre, the value of it now has increased to $1,000 to $2,000 an acre, and the whole of that increase in value goes to the reduction of taxes or to the development of the estate and the provision of new public services. There can be no private property in Letchworth. Land can be acquired for 99 years with the right to renew at the end of that period subject to a revaluation. It has been found that this system gives the practical feeling of ownership, while the important power is reserved by the trustees of the community to prevent misuse of the land by incongruous and undesirable development. An interesting feature of the Garden City scheme is the agricultural belt around the city. The city area comprises about 1,200 acres laid out for a population of 30,000 people; 2,600 acres of the original area, with an additional 700 acres since acquired, are reserved as a permanent agricultural belt around the city. Here farming is carried on, and here, too, are areas reserved for golf, tennis and other outdoor games. Thus the inhabitants have a large open area all around the city that can never be built upon, and the produce of this agricultural area is brought close to the door of the consumer.

COTTAGE OF PISE DE TERRE, NEWLAND CORNER, SURREY. CLOUGH WILLIAM-ELLIS, ARCHITECT.

The industry of farming is thus linked up with the manufacturing interests in one community avoiding the usual separation of town and country and the unsightly and ragged development on the fringe of the city which we have all so often deplored.

Hampstead is a garden suburb, not a garden city, the latter being complete in itself, while the former is residential only. It owes its origin to the work of Mrs. Barnett, who is at present in Canada, and will lecture in Toronto. Mrs. Barnett is the wife of the late Canon Barnett and his co-worker for many years in the East-End of London. After a lifetime spent in the closest touch with the physical and spiritual needs of the people in the East-End of London, she saw in Mr. Ebenezer Howard's scheme an opportunity for the improvement of the deadly monotony of the average London suburb.

She conceived the idea of a garden village at Hampstead, near the famous heath, now as a result of her efforts an open space for ever. The estate was laid out by Mr. Raymond Unwin, and to-day it is a place of great beauty. Both rich and poor live there, barristers, architects, musicians, actors and poets. These, of course, are the poor. It is only a short ride on the underground from the centre of London, but here are pleasant gardens and open spaces with great trees, every house well designed, and congenial men and women living there. There are few places on this wide globe where a person of modest means could be so content as in Hampstead.

Of post-war housing in England much has been said and written, and perhaps more has been accomplished than many critics are willing to concede. In proportion to the vast number of houses required, 800,000, according to a statement issued by the Ministry of Health, the number of houses actually built is astonishingly small. Plans, however, have been approved of some 250,000 houses, and contracts for the erection of about 75,000 houses have been entered into. The scarcity of suitable labor and materials is the root cause of the lack of greater accomplishment, but this will be remedied by a nation which generally triumphs in the end.

The state permits a local authority to borrow money and institute taxation for housing purposes, expenditure in excess of a certain amount is met by the state. In addition the state meets a proportion of the interest on the capital borrowed. The local authority is bound to build houses, if it does not the state steps in and builds them and charges the cost to the local authority.

I mentioned previously the fact that the state will present to the builder or private person erecting a house or houses the sum of $1,300 per house. This is a gift, not a loan, and is intended to assist in meeting the extremely high cost of building.

The shortage of bricks in England has caused attention to other materials, notably concrete, steel, wood and pise de terre or earth for house building, and I visited schemes where each of these materials was being used.

There are many advantages claimed for concrete in this connection; for example, cheapness where suitable aggregate is locally obtainable, speed in erection and ease of manufacture. Inso-far as cost is concerned, it is unlikely that under normal conditions concrete would prove much cheaper than brick. The clay for brickmaking and the aggregates for concrete are both raw materials generally obtainable at a low cost. The excessive demand for bricks, however, and their comparative scarcity probably makes concrete a cheaper material to use.

There are, roughly speaking, two systems of concrete construction in use, the pre-cast and the site moulded. Of the pre-cast system concrete blocks and slabs have found most favor, their use makes a continuous cavity possible. This, it is claimed, eliminates the possibility of dampness on the inside walls and assures coolness in summer and warmth in winter.

The entirely site moulded construction has not proved very popular; it is stated that houses built in this way are cold, that the walls "sweat" on the inside and are liable to crack. Possibly if such walls were strapped on the inside prior to plastering, some of these objections might be overcome, but this is obviously an added expense. In addition, for this type of wall, forms are necessary; these are not needed for concrete blocks.

One objection to the use of concrete is the hard appearance of the exterior walls. They do not "weather" as brick and stone walls do. The charm of the old cottages built of the two latter materials lies to a considerable extent in the mellowing caused by sun and rain and wind. Concrete does not appear to mellow in the same way; the application of stucco, however, assures an attractive appearance.

Among the many large schemes carried out in concrete blocks is the village of Chepstow, erected for the employees of the National shipyard. The external walls of these houses are built of two thicknesses of four-inch solid plain concrete blocks with a three-inch cavity, tied together with iron ties. In the first cottages built the blocks were each 32 inches long, 9 inches high, and four inches on bed. It was found that these blocks were too heavy for handling, and in the later houses the blocks were made 16 inches long. The concrete blocks were made on the site of local stone chippings and sand, and these blocks could be used a few days after making.

Houses have also been built of reinforced concrete. These houses, it is stated by the builders, cost considerably less than brick houses of the same size; they are rapidly constructed, an experimental pair being completed four weeks after the start of operations.

The steel frame system of house construction was introduced by Messrs. Dorman, Long & Co. at their industrial village, Dormanstown, Redcar, Yorkshire. Dorman, Long & Co. is one of the largest firms of steel manufacturers in England, their main works being at Middlesborough. During the war new works were opened at Redcar, and in order to house their employees a new village was planned near the works. The first 300 houses of this village were built during the war and were of brick.

When the company desired to extend the village, they decided to adopt a method of construction unique in house building, a framework of steel for the outside walls, upper floors and roofs, with hyrib as the concrete reinforcement.

The site of each house is first laid with a thick bed of concrete on which steel sills are laid and secured by Lewis bolts. The builders then proceed to erect the steel frame which consists of light rolled sections all made to precise standards and clearly marked before being sent to the site. The connections are made by bolts and nuts, no riveting being required. The erection of the frame in consequence takes but little time.

To this steel framework is attached the expanded metallic material, which is then concreted to a thickness of two inches; this forms the outer shell. The exterior may be finished in stucco or simply whitewashed. An inner wall or shell is formed of cinder concrete slabs three inches thick with an air space of about four inches between the inner and outer coverings. The interior partition walls are also built of cinder concrete slabs.

For the floors the reinforcing sheets are fixed to the steel joists by means of plate clips. The concrete is then applied to a thickness of two and a half inches with a smooth composition finish and with a half-inch coat on the underside to form the ceiling.

The roofs are of tile or slate laid on a similar reinforcing material. It is claimed that these houses are absolutely water-tight, the outer skin of reinforced concrete offering great resistance to the severest weather. It is further claimed that they are by virtue of the continuous air space cool in summer and warm in winter. The builders state that the cost is less than one of equal accommodation in brick, and that these houses can be much more rapidly built.

This type of house, if it could be built for a reasonable amount, would probably be quite suitable for Canada. Concrete floors with a composition finish might not prove popular here. Hardwood floors or stout linoleum could be laid on the concrete, but this of course would add to the cost.

The frame house is a traditional English method of building. It is probably true that the general use of wood for building is superseded by the use of more permanent materials as our resources increase. The tendency in the larger towns in Canada and the United States has been of late towards brick, stone and concrete, and it is unlikely that under normal conditions the building of frame houses would have been seriously considered in England. The war, however, and the consequent shortage of houses, has introduced an entirely new condition there —a pioneer condition—when a house that may be speedily erected is the need of the hour, and it is here the frame house may help.

Sir Charles Ruthen, an English architect, has built as an experiment three frame cottages at Newton, near Swansea, and in a paper read before the Society of Architects in London on October 16th last, he gave an account of their construction. Sir Charles said that these houses complied with all the essentials necessary for the provision of homes for the people and were cheaper than brick or stone houses and had the added advantage of rapidity of construction.

The first house of frame and stucco was erected and completed in thirty days; the second is a brick veneer type, and the third brick veneer and half timber work.

The type of construction adopted is the same as that in general use in Canada, the roofs, however, are of slate or tile instead of shingles.

The site at Newton was selected for the houses because of its exposed character. It is some two or three hundred feet above the Bristol Channel and fully exposed to the prevailing westerly gales. On visiting the houses one feels regretful that they are not more readily accessible; had they been built, for example, in the near neighborhood of London, so many more people would have had an opportunity to see them, and these houses would surely have conquered an island prejudice against the lately unknown and untried thing.

Sir Charles stated that the actual cost of the stucco finished house was £125 less than it would have cost in brick.

Mr. Clough Williams-Ellis, an English architect, has recently built on the estate of Mr. Strachey, the editor of the "Spectator," in the south of England, a small house of pise de terre or rammed earth which has attracted a good deal of attention. Buildings of this material are not new. They have been erected in France and Spain, and more recently in India and Rhodesia. The material, however, is new for all practical purposes so far as England is concerned.

Pise is merely earth to which nothing whatever is added. The earth is dug and thrown between wooden forms and rammed till it is perfectly hard and compact—until, in fact, what is practically an artificial sandstone has been created. The earth is thrown into these forms in layers of five inches or six inches, and then rammed until it is thoroughly solid, before another layer is added. When the mould is full of rammed earth, and the rammer no longer makes

(*Concluded on page 328*)

David R. Brown

Newly elected President of the Royal Architectural Institute of Canada.

R. A. I. C. Assembly, Ottawa

THE thirteenth general annual assembly of the Royal Architectural Institute of Canada was held at the Chateau Laurier, Ottawa, on October 1 and 2, with President A. Frank Wickson in the chair.

The meeting was opened with an address by Mayor Fisher of Ottawa, who extended a warm welcome to the visiting architects. In the course of his remarks, his Worship stated that perhaps the present period was not altogether one of unmitigated evil, that from it would likely emerge a return to first principles which would, among other things, exert a stimulating influence toward the development of a national architecture.

In responding to the address, President Wickson declared that as the knowledge of architecture increased the public would become more impressed with the fact that well designed buildings were not only a practical necessity, but an important factor in their everyday lives. Canada's building expenditure at the present time amounted to approximately $85,000,000 annually. As this represented developments which were carried out to endure a long time, it was an important matter that these structures should be so designed and constructed as to be a credit to the country.

Following the adoption of the minutes of the previous annual assembly, the report of the Hon. Secretary was presented. This report dealt largely with matters which came before the meeting of the Council at Montreal on July 10th, of which a complete digest appeared in the August issue of CONSTRUCTION.

The secretary reported that at the suggestion of the Royal Institute of British Architects, the Council is giving close attention to the action which is being brought by Messrs. Saxe and Archibald and other competitors against the Government in reference to the Ottawa Government Building Competitions. The R.I.B.A. is retaining the services of counsel to follow the case, and an appeal has been made to the provincial associations for financial assistance to help establish the rights of the competitors.

The attention of the meeting was also drawn to the conditions governing the competition for the St. John, N.B., courthouse, in which connection the Engineering Institute was criticized for usurping the functions of the architectural profession. It was stated that the Engineering Institute dealt with the entire project without any reference to the architects and that the conditions were not eminently satisfactory. The meeting decided to have the incoming Council give its prompt attention to the matter.

Reference was also made to the decision of the Council to have special or urgent matters dealt with by a special committee to be appointed by the general annual assembly. Heretofore, in cases demanding immediate action, it was found that nothing could be done owing to the fact that no meeting of the Council could be held until after thirty days' notice. The intention is to have the committee take prompt action between Council meetings on all such matters as the president may deem to be of an urgent nature.

The president stated that upon the request of Queen's University, a lecture was delivered at that school by a representative of the Institute. It was felt that much more could be done in this direction, and that practically every seat of learning would be glad to have some one talk to them on the subject of architecture.

The president further suggested that effective educational work could be done providing funds were available, and that arrangements might possibly be made with the film companies to show examples of good architecture, particularly worthy instances of good design of buildings erected in Canada.

An important subject up for discussion was the necessity of additional revenue to carry on the work which the Institute was doing. This was based on a recommendation of the Hon. Treasurer in presenting the financial statement for the year, and resulted in the adoption of a resolution to increase the membership fee to a sum not to exceed $5.00 annually. It was the general opinion that the present fee was altogether too inadequate for the important work and objects which the Institute was endeavoring to further.

Attention was also drawn in this connection to a resolution passed at the recent convention of the Ontario Association at London, asking the executive of that body to co-operate with the other provincial associations with regard to reinforcing the activities of the Institute and also with a view to co-relating the activities of the different associations, so that the work of the Institute might really be of a national character.

The hon. treasurer reported that as a result of representation made to the Board of Customs Duty, the tariff on imported plans has been increased from 1 to 2 per cent., and that an effort was being made to have a duty levied against specifications as well.

On motion of the hon. secretary, the Council was instructed to deal with certain proposed revisions to the by-laws in reference to special committee work, collection of fees, nomination of delegates, travelling expenses of Council members, and the fixing of the pro rata rate.

It was further decided to have the Council communicate with the provincial associations with a view to publishing a year book to comprise their several charters, by-laws and other regulations, and a list of the profession in the different provinces.

Prominent speakers addressed both the luncheons and the business meetings. Mr. Eric Brown, of Ottawa, gave a fine talk on "Canadian Art and the Canadian National Art Gallery."

Professor Percy E. Nobbs gave an outline of what has been accomplished by the Government as regards "Battlefield Memorials," and the probable conditions which will govern the proposed competition to select designs for the monuments to be erected.

Other interesting addresses were delivered by Mr. Charles H. Whittaker of the American Institute of Architects and President Anglin of the Association of Canadian Building and Construction Industries, who spoke on the labor situation and present conditions affecting the building industry. The subject matter of these addresses dealt exhaustively with problems of vital interest to the profession, and resulted after considerable discussion in the adoption of a resolution requesting the Council to arrange if possible with the provincial associations for monthly meetings in each city where local chapters are established, to which architects, engineers, contractors and representatives of the Trades Council would be invited to discuss questions affecting their mutual interests.

At the closing luncheon, Dr. C. A. Hodgetts of the Department of Public Health, and formerly Red Cross Commissioner at London, gave an interesting and instructive address in which he paid tribute to the services rendered by the architects to the Army Medical Service during the war. Dr. Hodgetts spoke of the power combined in the medical and architectural professions to make or mar human happiness. The subect was altogether an important one, and will be dealt with more fully in the next issue of CONSTRUCTION.

It was decided to hold the next general assembly at Winnipeg at a date to be fixed by the Council.

ELECTION OF OFFICERS.

The election of officers for the ensuing year resulted as follows: President, David R. Brown, Montreal; vice-presidents, W. D. Cromarty, Ottawa, and L. H. Jordon, Winnipeg; honorary secretary, Alcide Chausse, Montreal; honorary treasurer, C. S. Cobb, Toronto. Council: John S. Archibald, Montreal; J. P. Ouellet, Quebec; Joseph Perrault, Montreal; C. H. Acton Bond, Toronto; A. Frank Wickson, Toronto; Herbert E. Moore, Toronto; John M. Watt, London; A. G. Wilson, Edmonton; S. M. Eveleigh, Vancouver; A. S. Mercer, Vancouver; David Webster, Regina; W. C. Van Egmond, Regina; M. W. Sharron, Edmonton; A. Melville, Winnipeg; R. B. Pratt, Winnipeg.

Labor in the Building Industry*

By J. P. Anglin.

President of the Association of Canadian Building and Construction Industries.

THERE can be no industry of such vital interest to mankind in general as building construction. It matters not where man dwells or where he works, he must come in direct contact with actual building "labor" at some stage of his activities.

Of the three great necessities of life, food, shelter and clothing, the first and third come to us for the most part through salesmen. We seldom even see the "labor" which produces these. Building, however, goes on in full view, not only of its owner, but of the public as well. Then, too, who is ever free, even for a twelvemonth, from the presence of a representative of the building construction industry within the very four walls of his private dwelling? A broken pane, a split pipe, a cantankerous door, damaged woodwork, or some other of the hundred and one things necessary to keep our immovable property habitable demands the actual presence of the building mechanic.

If, then, the individual householder is vitally interested, how much more should the architect, the engineer, the contractor and the worker unite to study the labor problems of their common industry, and combine to raise its standards. . . . Both our organizations are the representative bodies in their line of endeavor, and should be definitely linked up to raise standards all through this great industry. The Architectural Institute needs every architect's support, and ours the co-operation of every contractor, as well as every supplier and producer of building materials. . . . Broadly speaking, all our problems have a direct or indirect bearing on the labor situation in our industry.

Let us briefly run over a little history, because a proper study of the past should be of material aid in developing out of the present difficult conditions something even better than has been. We cannot hope to do this in a day. It will take a generation or two, but we must begin, or building will degenerate into a purely mechanical or machine-made conglomeration of steel and stone.

---

* Address delivered at the Thirteenth General Annual Assembly of the Royal Architectural Institute of Canada, recently held at Ottawa.

We cannot dwell at length on ancient labor in the building construction industry, but we should recall those times of which we have all read, when the mechanic, architect, and builder were one and the same individual in most cases and where he was surrounded by a few whose ideals were of the highest, and who in turn were aided by a mass of common labor. Such was probably the case in the best Egyptian and Grecian work. Coming to Roman work there began to appear a more distinct division of duties, the builder more separated from the architect, and soon the desire for an estimate and fixed price cursed the community and the contractor was evolved.

As the present is an age of organization—perhaps too much so—we must consider the organization of guilds, which played such an important part on the continent in the middle ages. These guilds frequently had their origin in a desire to combat the power of the nobles. They became so powerful about the thirteenth and fourteenth centuries that in some cases they formed the basis of municipal government, and in order to participate in local affairs, a citizen had to become a member. (Surely this was the closed shop in the extreme). They even acquired the right to bear arms for their defence, and later the guilds were even victorious over the nobility and their power continued for several centuries. Only in the eighteenth century several edicts were issued in Germany, permitting all to practice any trade without having guild membership, and the same was done in Austria in 1860.

In England, these mechanics' societies began with the development of cities. They had no legal right to prevent any man from practicing his trade; the only restriction was Elizabethan, and required seven years' apprenticeship. It is noteworthy that the only English guilds of importance still in existence are those whose chief object is to give relief to poor and needy members.

In France, guild privileges were sold by the State, until the Revolution at the close of the eighteenth century, when every restriction to practice any trade was removed. It was during the first half of the nineteenth century that similar action was taken in the other European countries.

Unionism, or the modern trades and labor union, as we have it to-day, has developed to its present high state of organization during the past fifty years, and is the direct outcome of the modern system of industrialism, whereby factories, mines and general business is formed into large corporations, and in place of the old struggle between guilds and nobles, we now have labor unions versus capitalization.

The building trades, even before the formation of large contracting companies, were unionized. The fact that the work is so open and accessible makes it vulnerable, and the added fact that the workman is so frequently changing from one employer to another makes it difficult to develop or maintain any degree of mutual interest between the individual tradesman or mechanic and his employer. The formation of large companies also makes this individual contact more difficult, and, therefore, new means must be found for raising and maintaining the standards of workmanship in the various building trades.

In Canada we have been in the habit of depending on immigration to maintain our supply of building trade mechanics, while little attempt has been made to train the boys, and they are allowed to drift into other lines. We must begin at once a broad and comprehensive plan of apprenticeship and technical training, if we hope ever to improve the situation.

Apprentices were fairly common in most trades twenty years ago or more, but the rapid development of this new country held too great inducements in other lines than building. This situation was further aggravated by the war conditions, when even a boy could earn a man's wages in munition factories.

Another war condition was the rapid assimilation into munition work of the major portion of building labor. Steamfitters, carpenters, stone-cutters and masons, being trained men, soon learned the new game, and as building was slack and munition pay high, they did well. This affected the building labor by reducing the quality and efficiency of thousands of our mechanics in the building trades.

Still a further war condition was the scarcity of good tradesmen left for even the much reduced volume of work. This condition, and the wage competition of various localities and of other industries led to the actual bidding for "building labor." Even without the influence of trade unions, wages would have been greatly increased, but the union, taking advantage of this condition, forced greater increases in some trades than others.

At the close of the war we expected much unemployment for a lengthy period, and plans were made to boost construction to avoid excessive unemployment and to catch up with the building shortage. Our governments planned considerable work as well, but this was scarcely needed. While very little Government work was started, there has never been lack of employment, and even now, two years after the armistice, building labor is scarce in all trades.

As to *production* and *quality,* it is said that costs are high and work inferior. As to inferiority, can we not see that it is due chiefly to scarcity of good materials and the necessity to permit lower grades, and so poorer work results? No doubt a great deal of the inferior building is also caused by the fact that high prices tend to influence the owner to buy lower quality materials in order to economize.

Regarding *output,* I can say from experience, and after comparing pre-war with post-war unit labor costs, that the output or unit of production in most trades shows little change. Speaking generally, wages have increased seventy-five per cent. and costs about one hundred per cent. Curiously enough, such trades as bricklaying, painting, and even common labor, where wages increased about one hundred per cent., do not show as high an increase in unit labor costs as carpenter work and plastering and steamfitting, where the wage increase was less.

Production, however, is now greater than it was during 1919. It is still, nevertheless, far below what is possible. The old saying "an honest day's work for an honest day's pay" still holds good, I believe. But who is to determine the "honest day's work"—the workman? And who is to settle the "honest day's pay"—the employer? So long as we stand apart and wrangle at long range, just so long will dissatisfaction continue and low output and inefficient work continue.

The only way we can improve matters is to get together and study one another's difficulties and problems, and arrive at an understanding.

It is said by some that the proper way is to wait for hard times and poor conditions to come, and then, perhaps, we'll have the upper hand and demand lower wages, longer hours and big output. The man who uses this argument is going along as our forefathers did a generation ago. He is reckoning without his host—organized labor.

This is the age of centralized control, and the great unions have been learning the game until they have developed the largest and most powerful machine-controlled organization in the world. The outstanding proof of this is the manner in which they forced their way into the Peace Negotiations, and even had labor clauses written into the Treaty itself.

In my humble opinion, this was labor's crowning victory, and unless great caution and care are exercised by its leaders, it will steadily decline as a world factor. If labor unions as a class attempt to dominate all other classes, by forcing "unfair demands" and "unfair conditions" by means of the undemocratic "closed shop" principle, instead of following the lines of real service to its members and the community, they will go the way of the old guilds.

The "closed shop" principle is not only undemocratic, but it is as inimical to the true and permanent success of labor as it was in the middle ages the cause of the ultimate failure of the guilds. The first plank enunciated in the trade union platform, viz., "the abolition of all forms of involuntary servitude," is contrary to the principle of forcing a worker to join a union before he can earn a livelihood.

Please do not misunderstand me. I am not opposing organized labor. I believe in organization, but not in over-organization, or in the abuse of organized power. The moment an organization departs from the high ideal of service both to its members and to the community, its usefulness is impaired. You perhaps recall the cartoon which portrayed "Giant Capital" standing ready to battle with "Giant Labor," but before the struggle they both looked up and beheld across the narrow river a third who was called the "Great Unorganized Majority." This third giant was many times larger, and stood gazing on them with interest. There could be no serious fight in his presence if he stood up for his rights.

Turning to the consideration of the question of building labor, what are its present problems and future needs? There is no doubt in the minds of most sane men that this is an age of organization, rather than a period of individualism, and further there is no doubt but that the only way to meet organization is with organization. We must first, last and always aim to render the service that will demand the respect, support and aid of all engaged in our branch of the industry, whether it be labor, business, or professional. The man who will not get under his special organization should be looked down upon as one who derives a benefit without paying his way. Individuals who "ride free" should not be tolerated. . . .

At the great National Industrial Conference in Ottawa, about a year ago, there were nearly a hundred delegates representing labor, whose whole time is paid for by labor organizations. Millions upon millions of dollars are contributed by our employees to carry on their unionizing work. Is it not high time that we gave without stint to our societies and associations, so that they can employ the staff, and be prepared to co-operate in the great service-rendering campaign? If we fail in this we shall fail utterly to solve present problems or meet future needs.

Having strong organizations we can then function adequately, and at least try to solve our problems, and anticipate our future needs As an illustration, let me cite the case of our "National Joint Conference Board" in the building and construction industries. At present it is composed of five representatives from our Canadian Association and five from labor in our industry. There is an independent chairman. Why should not the Royal Architectural

Institute of Canada and the Engineering Institute also be represented?

The aims and objects of this Joint Conference Board are set forth as follows:

(a) The functions of the National Joint Conference Board shall be of an educational and advisory nature, furnishing a common meeting ground for the discussion of questions affecting employers and workmen in the building and construction industry of Canada.

The National Joint Conference Board shall remain in this advisory and educational form for an indefinite period, but it may exercise such powers as may be granted to it from time to time by the affiliated memberships.

(b) The National Joint Conference Board shall undertake to present to the Government such measures as may be requested by both groups, parties to the Board.

(c) The National Joint Conference Board shall advise with the organizations affiliated with it on measures which are considered to be of value in improving the building and construction industry, such as technical education, apprenticeship system, movement of labor, etc.

(d) The National Joint Conference Board shall encourage the organization of the employers and workmen in the groups represented by this Board into Local Joint Industrial Boards, for the settlement of disputes in the building and construction industry of Canada.

(e) The National Joint Conference Board may deal with disputes referred to it for settlement by affiliated organizations or established Local Joint Industrial Boards, provided they have been submitted in writing to the Chairman-Secretary and in his judgment are of sufficient importance to be brought to the attention of the Board.

Let me also enumerate some of the subjects we have already had under discussion, and plans for future action now in course of preparation: (1) Consideration of Causes of the Cement and Coal Shortage; (2) Proposal to Institute a Standard of Practice for Local Joint Industrial Boards, based on the experience of those now in operation; (3) Improved conditions which may result from the more scientific movement of Labor, to avoid seasonal unemployment; (4) Standard Apprenticeship Agreements, and the Training of Apprentices; (5) Wage Agreements, and their Effects; and (6) the Housing Shortage in Canada and its possible remedy.

Is it not evident that by adopting definite prescribed lines of action jointly with labor in our industry, we have taken a long step forward? Suppose we are able to agree upon a Canadian apprenticeship contract, establish attractive wages for boys, and add a system of technical training for them in the various building trades, do you not believe we will have more apprentices and better mechanics a few years hence?

We also believe we can formulate plans for the stabilizing of wages and the transportation of men from points of unemployment to points of employment. If necessary, we can together encourage the immigration of good mechanics in some trades where we are continuously short, such as bricklaying.

The architects can suggest some work for this National Joint Conference Board in the Building Construction Industry, and if it functions properly, much good for the industry and the community can be accomplished.

Some improvement which might be worked out through all Canadian-wide organizations cooperating with labor within our industry are:

(1) The unification and standardizing of building by-laws for various types of cities and towns.

(2) The standardization of building units for various types of cities and towns.

(3) The standardization of all building units and equipment.

(4) The equalizing of architects' and builders' responsibility in the provincial codes.

(5) The publication of standard practices in modern building construction.

(6) Town planning and zoning needs attention everywhere. Should we not lead in this necessary work?

(7) Housing could also be solved by such a Joint Board, if it is possible for anybody to solve the problem.

In so far as the immediate future is concerned, I believe the architect and the contractor can do considerably more to serve their clients and themselves by studying ways and means of reducing labor costs than is generally appreciated. A joint board should be created for this purpose.

At random, I would submit that labor costs could be lowered if the architect would more carefully apply the following suggestions:

(1) Eliminate multi-materialed building designs, as far as possible.

(2) Design buildings with minimum quantity as well as minimum variety of material.

(3) Localize to the limit, in the selection of materials.

(4) Anticipate by several months, information and details for the progress of your work.

(5) Consult master builders, even when design is in embryo.

(6) Specify briefly, but clearly and completely.

(7) Give decisions without delay.

(8) Allow rational time for building at normal speed.

These points will all tend to greatly reduce labor costs. So many architects and engineers fail to appreciate the extreme difficulties of present-day building, owing to shortage of materials, slowness of delivery, and the carelessness of the average individual.

Again, I would suggest that the contractor can do just as much on his side. I would like to see him make a serious effort along the following lines:

(1) Careful planning and routing of materials and sequence of work by looking well ahead.

(2) To study the work in hand so as to eliminate surplus labor.

(3) By taking a greater personal interest, either directly or indirectly in his workers, and to show them his costs and output.

(4) Having an up-to-date plant, and keeping it up.

(5) Careful handling of materials, and the avoidance of waste.

(6) The more careful selection of men, and the training of apprentices.

(7) Seeing that when a piece of work is done, it is done right, so that no come-back is possible.

Now about the client—can he help reduce his own cost? Both architect and contractor and even building workmen could help him with suggestions:

(1) By being fairly sure of what he wants, and of his requirements, and thereby avoiding as much as possible subsequent changes.

(2) By giving ample time for drawing and specifying and also for quantities and pricing.

(3) By beginning far enough ahead to avoid overrushing and overtime.

(4) By prompt payment of both contractor and architect, thus ensuring efficient attention.

(5) By being rational in his time requirements. As a rule an under-manned building will cost less than one that is over-manned. (This one thing—the demand by the owner that operations must proceed in spite of conditions, is responsible for more raising of wages and costs than any other one factor).

(6) By getting back to the fixed contract system of building.

Coming to the consideration of labor, what is the course open for our building mechanic and workman? We can all make suggestions, but how can we get back the respect and goodwill of our men? The men, who when all is said and done perform all of the manual labor, and to whose technical skill we owe the actual execution of the architect's design and the contractors' orders.

You may say, "Let him get busy and give us the day's work we used to get in years gone by." We know, and our clients know, and the worker knows that the average output per hour has been going lower year by year until we touched the fifty per cent. efficiency mark. This was reached in 1919, when some false prophet started to proclaim the gospel of "cut your output and so help to provide employment for all." This was when unemployment on a large scale seemed to stare us in the face.

No one thing has done so much to injure our industrial life during the period of unrest as this kind of false economic teaching. Its effect was immediately to increase costs, reduce buying power and, therefore, demand dropped, and there is really less work for all as a result. It is a simple truth that increased individual output reduces costs, increases buying power, and so creates employment.

What is needed chiefly is enlightenment on these questions. The workman, especially in our industry, is a highly intelligent being, but we are not appealing as we should to his sense of reason and perception, in a way to gain his respect.

There are already signs of improvement. The unrest is abating, and efficiency is gradually coming up. But, it is a voluntary improvement, as it should be, of course, and will only become permanent if we meet our workmen half way. They must feel the personal interest of the architect, the contractor and the owner. We can do this best on the works, but also indirectly. We should be ready at all times to confer on questions of mutual interest, and before long we would restore the confidence which we seem to have lost.

On their side, the building mechanics should help the employer by co-operating to the extent of encouraging their sons and others to become apprenticed, and further by aiding the beginner in every way possible to become a proficient mechanic. Is it not far better to teach our own boys rather than to go on depending on immigration? It is surely better to try to grow Canadians than to try to assimilate foreigners.

By being more frank all around in our dealings with labor, so that our men see the true situation, I feel satisfied that output will increase, and building costs recede, even without a reduction of wages.

Therefore, I would urge upon all engaged in the great building construction industry, whether architect, engineer, contractor, manufacturer, or workman, that we strive to get together and break the sod on common ground. Let us, for the sake of rendering that service for which the community is longing, begin without further delay to lay a foundation worthy of our noblest ideals, in the hope that we, or perhaps others who follow after, may erect a solid superstructure in the near future which shall represent the most efficient type of joint workmanship.

Let us remember that we are producing one of the world's fundamental necessities, shelter. We have assumed that trust, and from present indications we are making a failure of it. We are certainly falling far short of what it ought to be possible to attain. The terrible post-war world diseases of sloth, carelessness, materialism, and self-interest, still have us in their grip. We must shake them off, and by careful application and co-operative service lead in the upward struggle.

Steel Tubes for Reinforced Concrete

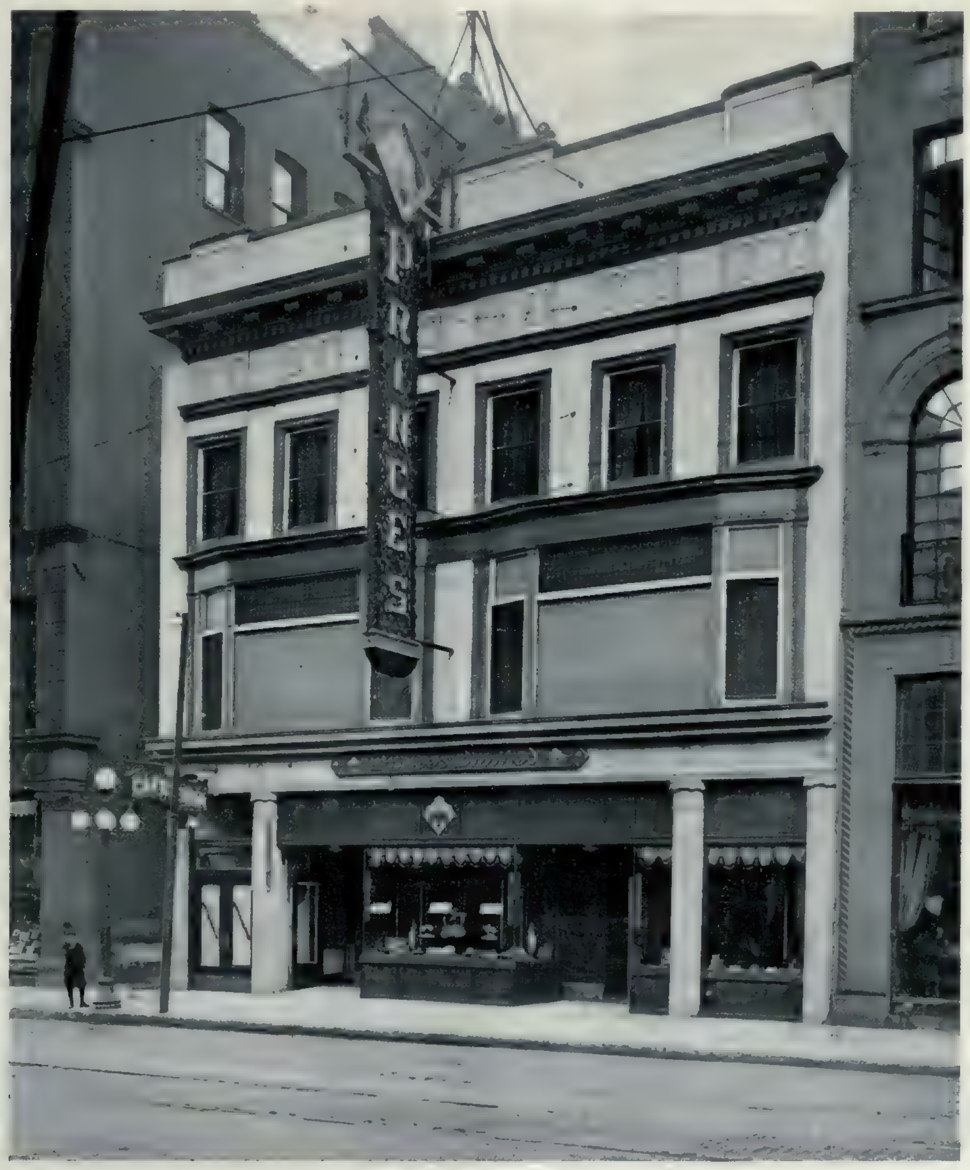
The increasing use of reinforced concrete for buildings of every description makes the question of the behavior of such structures in case of fire exceedingly important. Owing to the tendency of the steel supports to become overheated, there is a risk of the structure collapsing when exposed to fire. In order to obviate this danger a British engineer suggests that steel tubes might be used in place of steel rods and arrangements made to circulate water automatically through the tubes in case of fire. He considers that the cost of such an arrangement would not be excessive, and that it would serve to save the structure from collapse.

Premises of Princes Limited, Toronto

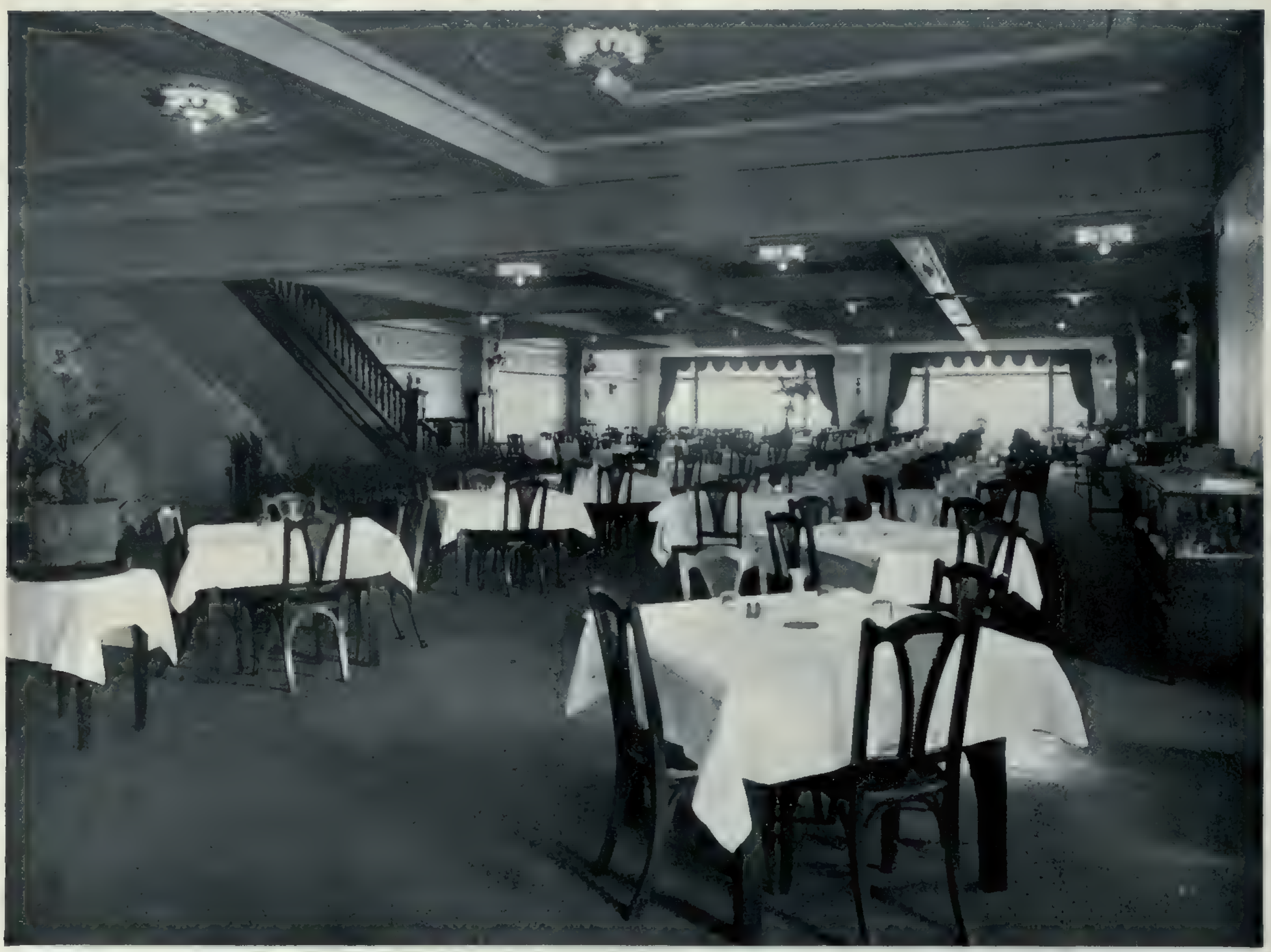
IN the premises of Prince's, Limited, the problem of the architects was that of remodelling the old Fairweather building at 84 Yonge street into an up-to-date catering establishment. It is therefore not a new structure, but one which has been so extensively altered as to be entirely new in character. In adapting the building to its present requirements, a complete rearrangement of the interior was necessary. The original structure had a series of large columns down the centre of the front portion. This objectional feature was removed by spanning the entire width with large steel beams supported by steel columns in the walls.

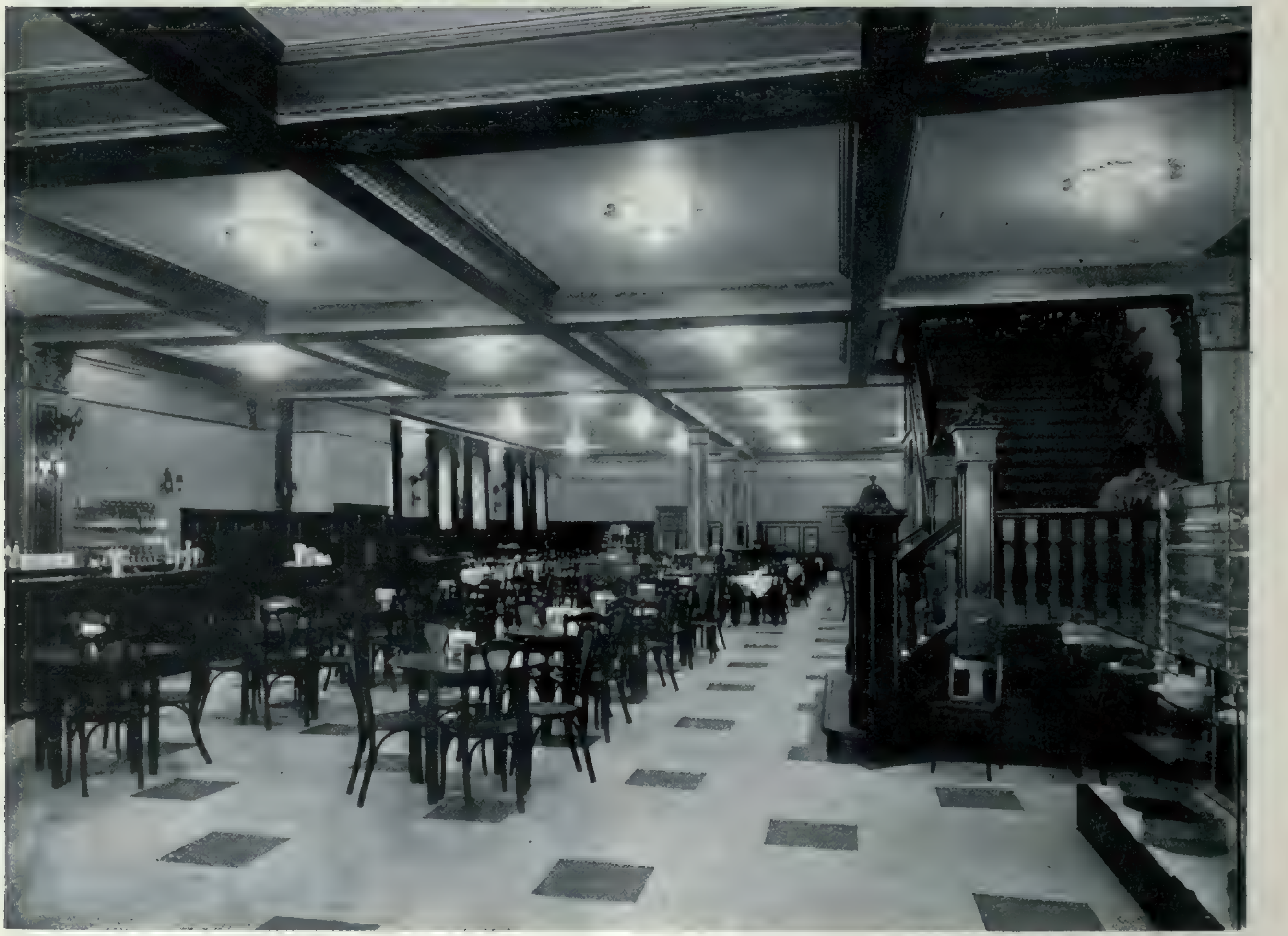
Moreover, the old store front was removed, as were also the steel columns supporting the front wall. New steel beams were set in position and encased with cut stone forming octagonal columns with carved caps. Above the ground floor the facade has been remodelled and finished with a cement plaster, giving a pleasing effect.

The feature of the scheme lies chiefly in the treatment of the interior, which is rich in coloring and decorative effects. On the main floor, as one enters, are the confectionery and French and Danish pastry sections, including an elaborate soda fountain, and immediately back of this are tables and chairs with accommodation for 500, where light luncheons and refreshments are served. The character of the ornament is Pompeian, and the color scheme in gold, black and bright red. In harmony with this is a terrano floor with gold colored ground, inset with



PREMISES OF PRINCES LIMITED, TORONTO.





UPPER VIEW: MAIN DINING ROOM. LOWER VIEW: GROUND FLOOR SECTION.

PREMISES OF PRINCES LIMITED, TORONTO.
DENISON & STEPHENSON, ARCHITECTS.

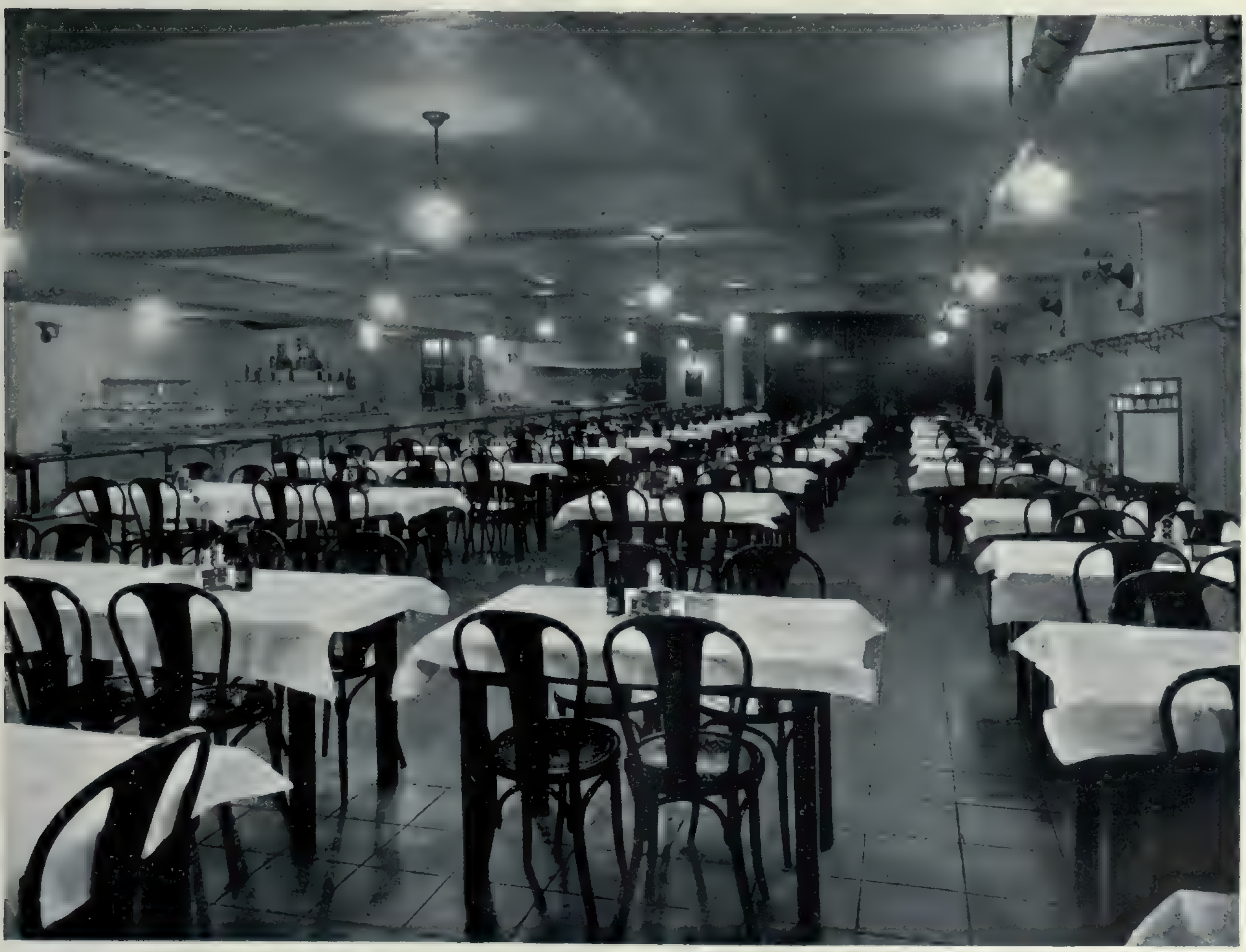
black squares at regular intervals. The walls are treated entirely as a background, only the pilasters standing out in relief. The ornament is rich and dignified in character, but is by no means overdone.

The building is 150 x 43 feet, three storeys and basement with an additional storey to the rear portion, and is used entirely for the business of the owners. Besides the ground floor accommodations, the plan divides itself into a basement cafeteria, main dining room and ballroom. The latter two are reached by a wide and well-proportioned staircase, under which the manager's office is located. The main dining room is approximately 110 x 41 feet, with separate lavatory accommodations, and direct kitchen service at the rear. The scheme is Adam in character and exceedingly rich in design. The ornament has been handled with great skill to conform with the architectural lines and is beautifully modelled and pleasing in detail. The ceiling and walls are in ivory and the element of color chiefly supplied by the draperies and carpets, the whole resulting in a most charming and inviting effect.

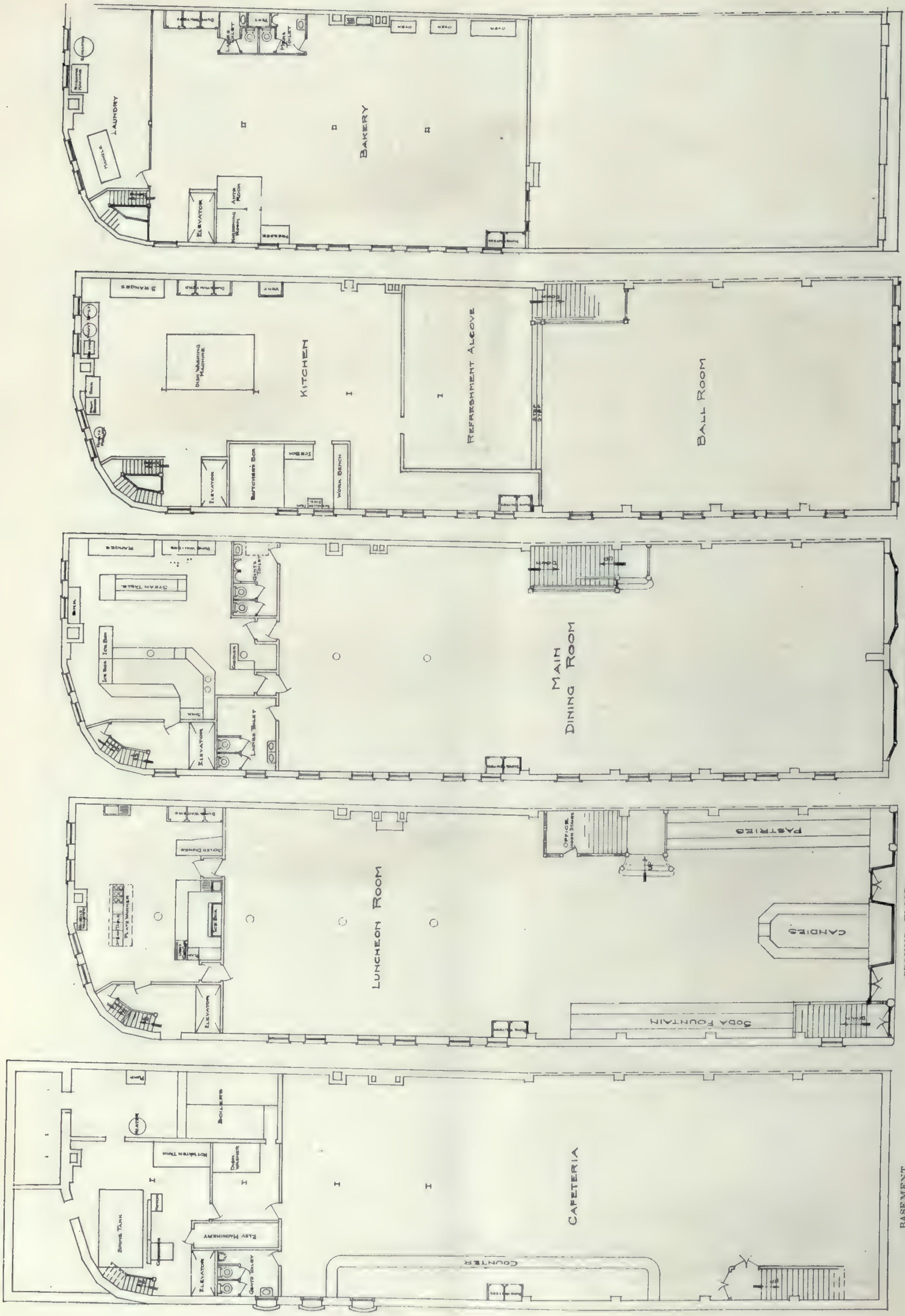
The ballroom is located at the front portion of the third floor, and is shown by plan only. The treatment here is quite simple, the wall being carried out as a background, and depending on the dresses of the patrons for color. The ceiling is in gold and black, and the lighting fixtures the main feature. A dancing space, 42 x 64 feet, is provided with an adjoining alcove where refreshments may be served. Italian draperies in black and gold with nicely balanced lambrequins of pleasing design are used on the windows and stand out in pleasing relief against the walls.

The basement has a separate street entrance, and is devoted entirely to the cafeteria. In order to gain more height, the basement was excavated three feet below its original level. The walls are finished in cement to imitate stone; the floor is of concrete in tile pattern and colored red, and the ceiling finished with ornamental plaster beams.

The fourth floor extending over the rear portion is used entirely for manufacturing purposes, and is equipped with modern facilities for carrying on a high-class baking and confectionery business, thus making the place a most complete and self-contained establishment, the pastries and candies being conveyed to the ground floor counters by electric dumb waiters.



BASEMENT CAFETERIA, PRINCESS LIMITED, TORONTO.



TOP FLOOR.

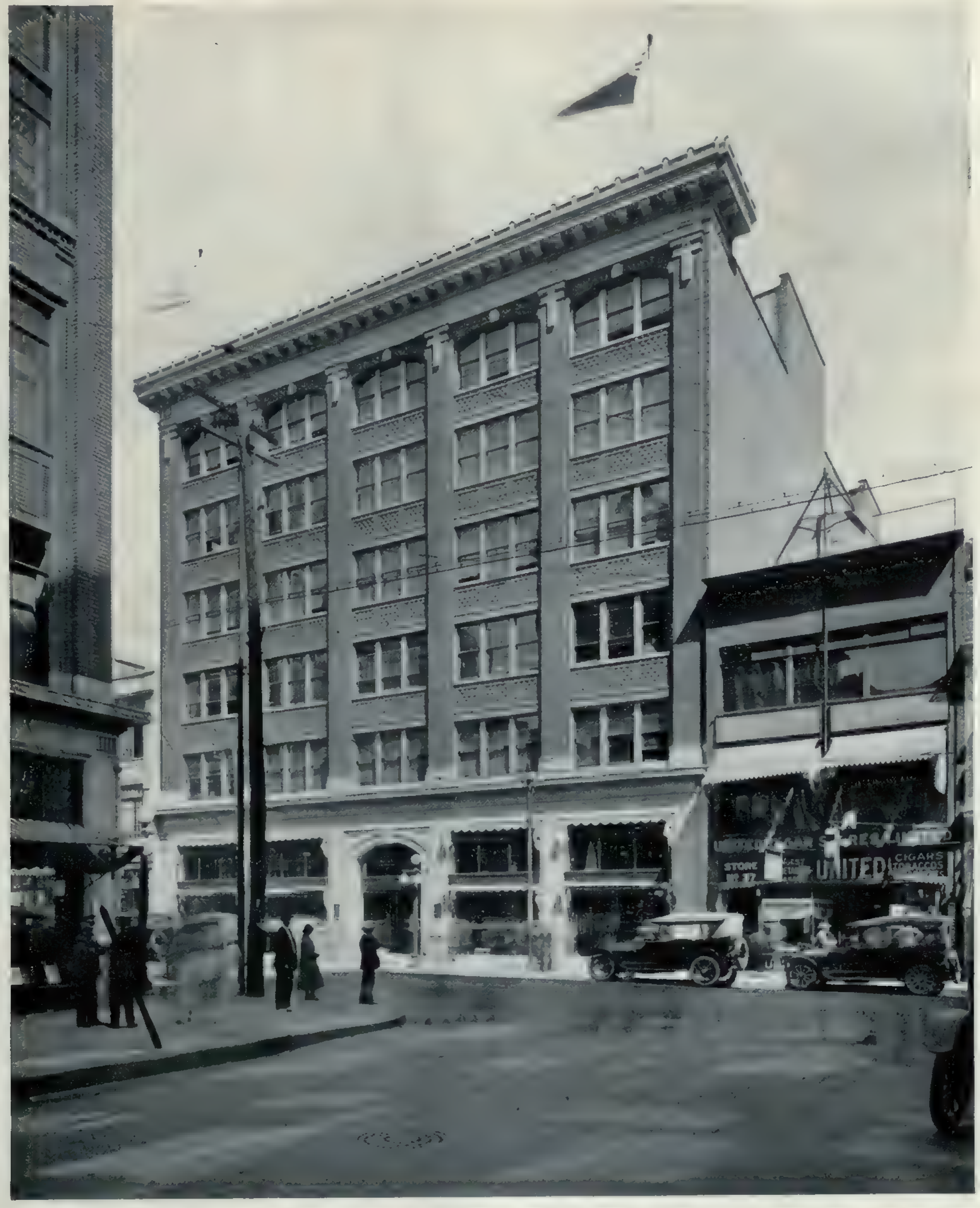
THIRD FLOOR.

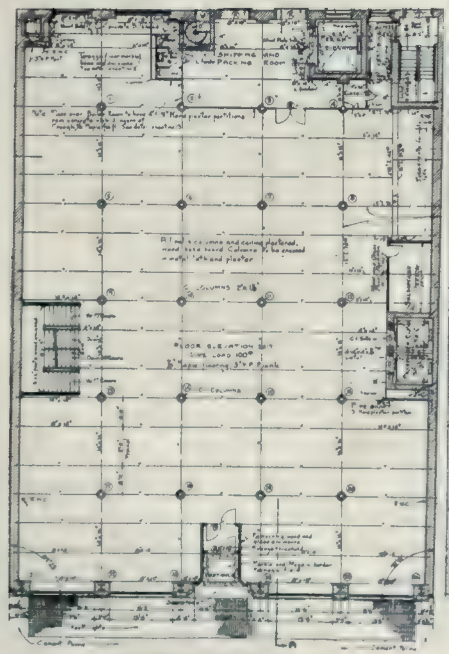
SECOND FLOOR.

GROUND FLOOR.

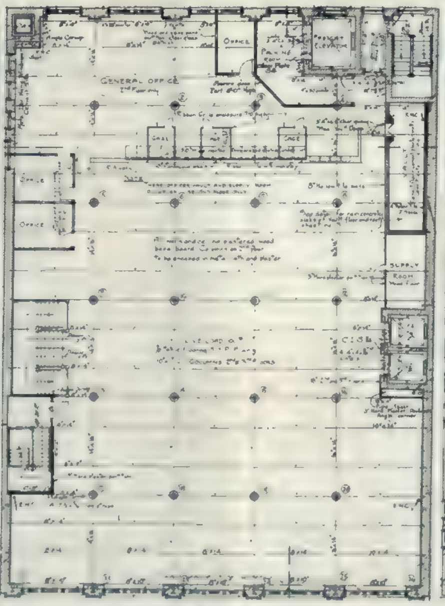
BASEMENT.

PREMISES OF PRINCESS, LIMITED, TORONTO.
DENISON & STEPHENSON, ARCHITECTS.

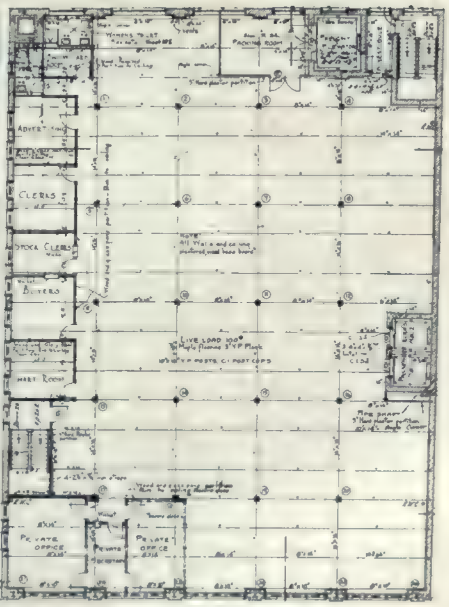




GROUND FLOOR PLAN.



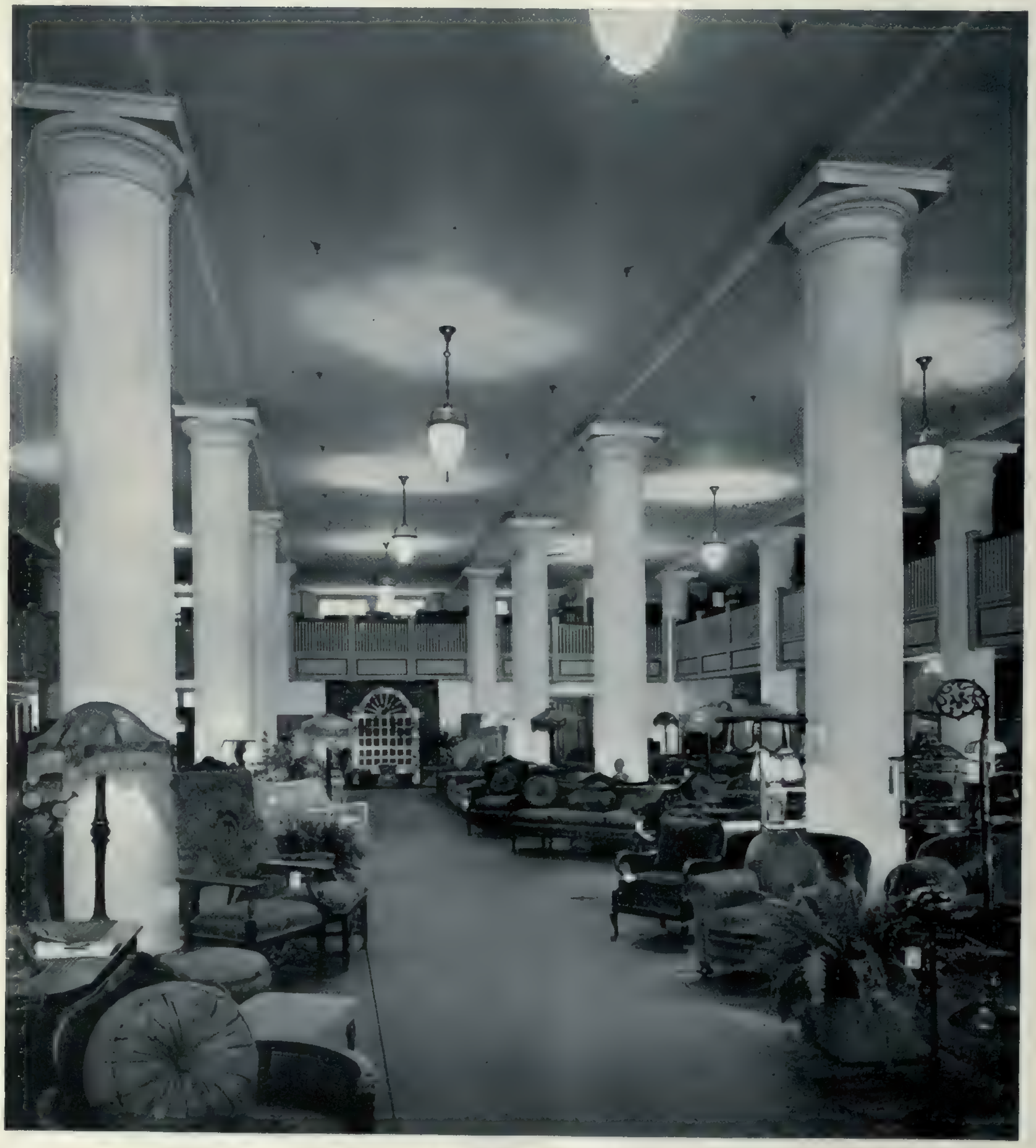
SECOND FLOOR PLAN.



TYPICAL FLOOR PLAN.

ADAMS FURNITURE COMPANY'S BUILDING, TORONTO.

WM. STEELE & SONS CO., ARCHITECTS.



GROUND FLOOR: ADAMS FURNITURE COMPANY'S BUILDING, TORONTO.

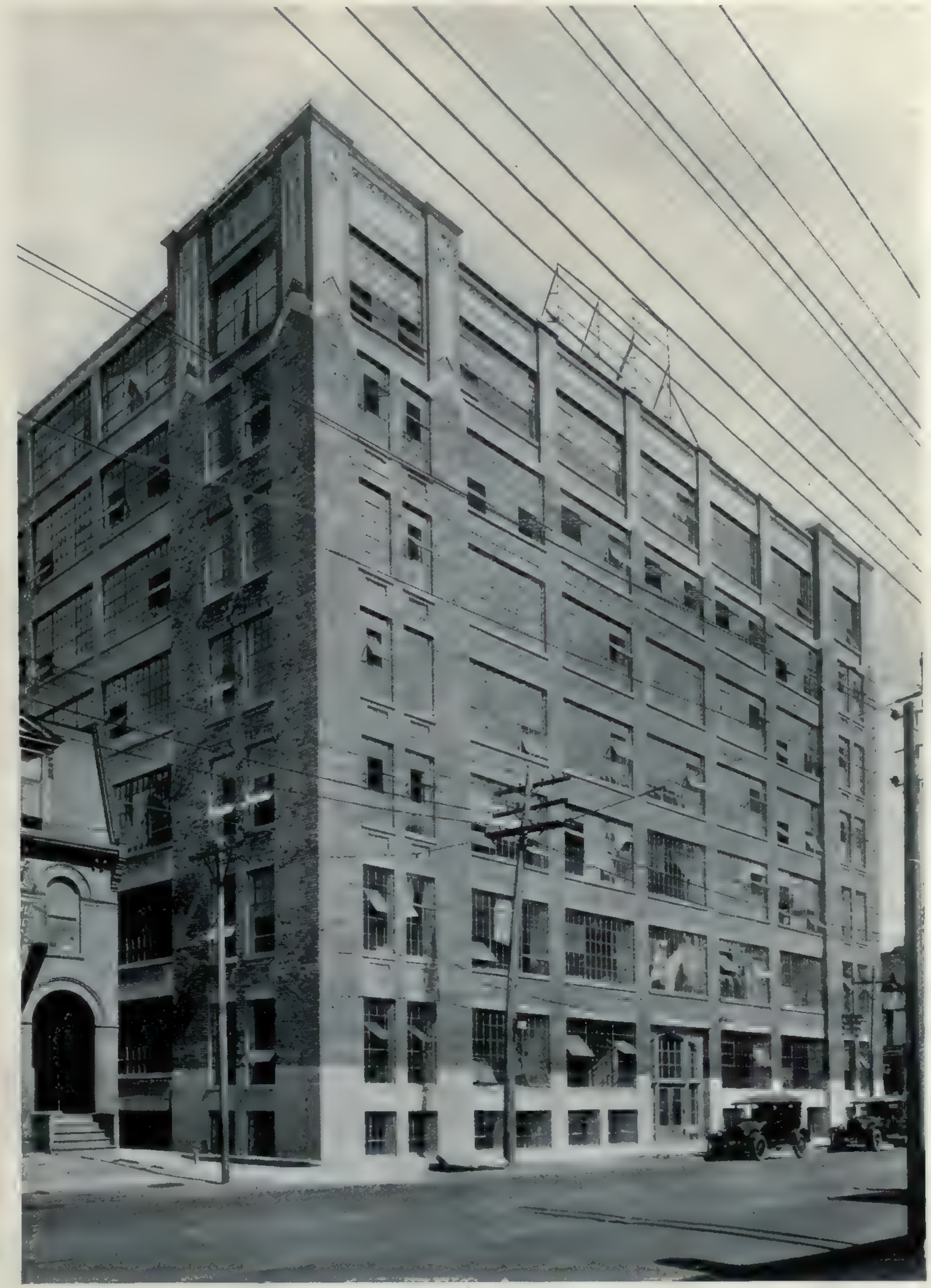
Adam's Building, Toronto

The new building of the Adams' Furniture Company, Toronto, is one of several developments which have been recently carried out due to changes in leases in the downtown business section. It not only provides premises well suited to the needs of the owner, but at the same time represents a noteworthy improvement in the vicinity of Yonge and Albert Streets, by replacing two commonplace brick structures which previously occupied the site.

The building is of mill construction, 88 x 122 ft., with cast iron supporting columns enclosed in plaster. The lower storey is of cut stone with a large frontage of glass for display purposes. Above this the facade is faced with brick having a rough texture and flecked with soft red, brown and neutral tones. This wall which faces the west, together with the north and south walls, have cantilever footings.

The plan in itself involves no special problem, but consists mainly of open floor areas with aisles dividing the space into sections for the arrangement and display of furniture. The main floor, which is 20 ft. high, has a mezzanine extending around it four sides. The typical floors have a height of 12 ft. 8 inches, and the basement a height of 12 ft. The general offices are on the second floor, and offices for the buyers, stock clerks and shipping department on the fourth and upper floors.

The building is equipped with an approved sprinkler system with all piping concealed, together with centrally located passenger elevators, and a freight hoist connecting with the receiving and shipping space at the rear.



NEW HOBBERLIN BUILDING, TORONTO.

Hobberlin Building Toronto

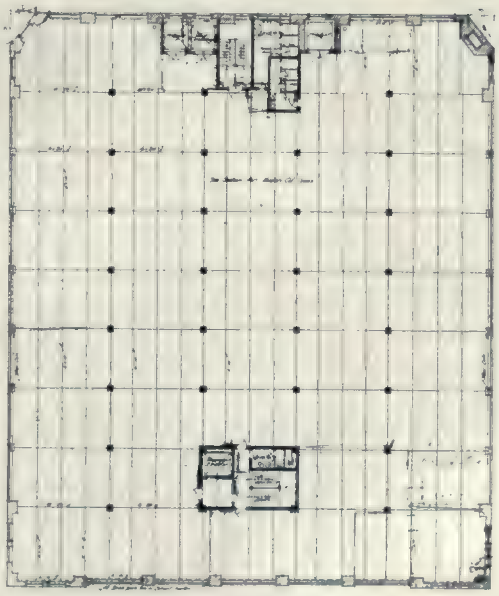
This building was chiefly erected for the garment and needle trade of Toronto. The floors are 120 x 145 ft., giving an area of 17,400 sq.ft. to each floor. The height of the building is seven stories and basement, making a total of 140,000 sq.ft. for the entire building. The feature of the design is that is ensures a maximum of interior light, notwithstanding the width of the building. This has been accomplished by adopting steel mill construction which allowed of the use of about 90 per cent. of glass, the sash units being approximately 15 x 23 feet.

The floors are designed to carry a live load of 150 lbs. per sq.ft., the flooring itself being three inches thick. The resting and intervening beams are placed on six-inch centres, and all heavy timbers were put in place in two or three sections to avoid checking. The columns of the basement floor are 20 x 20 inches, consisting of four 10 x 10 inch timbers. The principle beams are 16 x 20 inches, consisting of two 8 x 20 inch timbers. The super floors are of mastic 1¼ inches in thickness.

The building is equipped with four high speed elevators, sprinkler and water curtain, and was completely erected in 78 days. Over 1,000,000 ft. of B. C. fir were used in its construction.

◆

The Legislation Committee of the Toronto City Council is considering a proposal to exempt all houses erected at the present time from taxation for a period of three years.



TYPICAL FLOOR PLAN.

Post War Architectural and Building Problems

An address by Charles H. Whittaker, American Institute of Architects, before the recent Ottawa R.A.I.C. Assembly.

ANY of the several phases of my subject would be quite a large order for me to talk about, and yet all of them are so intimately related that it comes down to describing or narrating, as best I can, where the profession in America is finding itself at the present day in relation to its problems of practice as individuals, and how much greater it is finding its problems and adjusting itself to changes in the building trades brought on by the war, and also the tremendous problems being raised by the expansion of our communities and our big cities.

We are passing very rapidly from the stage of individual problems into the stage of great community problems; and they are very pressing problems, and we have a crisis on the way.

All of these things came about so far as the profession in America was concerned, I suppose, as a result of the war very largely. Of course when the war burst upon us there was a serious complaint that architects were not appreciated by the Government, and that the profession was being overlooked. Towards the close of the war, in fact, before we had any idea that the war was to end when it did, I believe the Institute (A.I.A.) appointed a committee to undertake a little more extensive survey of the practice of architecture in the United States, and very generously gave that committee $10,000 with which to do its work. It was quite the largest thing the Institute has ever tried to do, and the committee was organized both within and without the Institute, because the American Institute of Architects is only partly representative of the profession in the United States.

We tried to make the committee very general, and to draw into it all the architects, whether they were affiliated with the Institute or not.

That work went on for something like two years, I think. It did not develop anything that we did not know before, but it had one very great effect—it did concentrate the attention of architects for a certain period on problems with which they were quite unaccustomed to deal.

We were able to raise questions for discussion both in the Institute Conventions and in the Chapters (of which there are forty in the United States), and for the first time in the history of architecture in the United States we really got architects down to a national discussion of the problems with which we were faced.

The end of it was that I think the great majority of us became convinced that if we wanted to solve the problems that we called architectural and as related to the practice of architecture we should have to dig pretty deep into the business of building. A few of us had thought that for a long time, but I think it is pretty well understood in the United States now that architecture, the art, and building, the business, are two quite separate things, and that they do not go along side by side the way we think they ought to go.

Out of the report of the Post War Committee it was recommended that a study be made of the building trades in England and what they had been doing, and the last convention of the Institute authorized the directors to undertake such a study if they could. All of this crystalized in a meeting held in Chicago last Monday (Sept. —) at which for the first time in America we got together representatives of practically all the major elements of the building industry—architects, engineers, manufacturers, contractors, and labor leaders. That conference was called as a result of the preliminary discussion we had at Atlantic City in August, and its object was to make a survey of the building industry in the United States, and in some manner to find ways and means of raising the money necessary to make such a study.

Of course it came about, as I said, very largely on account of the serious study of the building industry in Great Britain that was made by the Committee on Scientific Management and Reduction of Costs of the British Trades Parliament. I have no doubt most of you are familiar with the report of that committee. It was a very startling document, which, as a principle, recommended that the building industry of Great Britain be transformed into a public service. I think this is the most remarkable document that has come out of the war as bearing on the question of industrial relations, because it was made by a committee composed of an equal number of employers and employees.

I do not think there is any doubt among the great majority of the profession in the United States to-day but that we are faced with problems in architecture which have their roots in our economic system, and one of the tasks which this Congress at Chicago will have to carry out if things go as promised, is to make a study of the building industry as a machine, to see how it functions, and see why it is not functioning at the present time, because the building industry in the United States is really paralyzed; it is at a standstill, except in certain directions where buildings are so badly needed that the cost does not matter, or in the case of moving picture theatres, and things of that sort.

Then, again, so far as the supply of houses is concerned the building industry is absolutely unable to function. There are very few houses being built in the United States, and there does not seem to be any prospect of houses being built.

Now, the point is to get at what is the reason for this condition.

I think up to the beginning of the war the preponderance of opinion in the American Institute of Architects so far as the development of architecture in the United States was concerned would be about like this—our function is to educate the public. We must get them to appreciate architecture. We must teach them what architecture is, what it means, and what we as architects have to offer. Our job is a job of education. I think that opinion still holds among the minority in the United States, but I think the great majority are beginning to feel that it is no use to give education unless you can also give power to utilize that education. In other words, to put it briefly, there is no use teaching the people what good architecture is unless good architecture is economically within their power.

The history of building in the United States does not show that at all. It shows that so far as the supply of homes is concerned it is quite impossible to give good architecture economically, that evidently there is something very wrong as between architecture, the Art, and building, the business. There is a great hiatus between the two, and they do not fit together at all.

I should like, if I may, to run over the three major things on which we concentrated our attention so far as this committee is concerned. They seemed pretty remote from architecture, the Art, and I am reminded here, as I am always at our own conventions, of the fact that architecture, the Art, seems to get very little discussion. On the last day of our conventions of the American Institute of Architects, two or three men rise very mournfully and bewail the fact that three days sessions have been devoted to registration, and competitions, and schedule charges, and by-laws, and this, and that, and that no one has talked about architecture. That really indicates what I think is quite a significant fact; that the business side of architecture and building is gradually encroaching upon everything else, and there is hardly any time left for architecture.

Building to-day is a business, for the most part. It is a competitive business. It is a profit making business. And when I say these things, and when I say a good many things I shall say, please do not think I am dogmatizing or that I have any hard and fast and fixed opinions. I have some opinions, but I will try to conceal them.

Just imagine we are all of us, if you will, simply going into a sort of a laboratory to try to dissect this building industry, this building business, pull it to pieces and see what it is composed of, and how it works, and why it does not work. That is the only way to get at the truth about it.

After we have made our start, the first thing that ought to come to our attention is the fact that you cannot build buildings without putting them on land. Then land has something to do with the building business. You must have land to put a building on, and I must confess it seems a rather remarkable thing to me that so many architects have not seen the connection between land and the building business.

I imagine that here, as in the United States, almost every architect has been up against the problem of the rising cost of land. Certainly we have it in the United States, and certainly the answer that we have sought in the United States has been a larger volume of building on the same piece of land in order to make the investment pay, or a cheaper kind of building on the same piece of land, or packing more people into an apartment house on the same piece of land, because it is only by one of those three that you can make the building profitable, and, of course, the building has to be made profitable.

Therefore, at the very outset you must recognize that somewhere or another the cost of land plays a tremendous part in architecture, in building, and in building progress, and unhappily the more large cities expand the higher grows the cost of land generally, and all that extra burden has to be somehow swallowed up in the building and made to pay. If you compare it with the architectural period of Greece, or the medieval period of Europe, you find the same problem did not exist.

The housing crisis which has overtaken all our cities is, as the Reconstruction Committee of the State of New York said, primarily a land problem. Your Ontario Commission said the same thing. It is being said pretty generally all over the world. It is a land problem. We cannot solve the housing problem until we can solve the land problem. Solving the land problem alone will not solve the housing problem, but it is the first thing that has to be done. You cannot escape it, and you must deal with it if you are really going to study the building industry, if you are really going to study what is the matter with building, if you are really going to study what produces the disordered congestion of our American cities. Some of our cities have brought themselves to such a pass that it seems almost humanly impossible for them to extricate themselves. I do not know what will become of cities like New York and Philadelphia, for instance. On the face of it it seems utterly ridiculous to think of packing more people into the City of New York where they cannot possibly be handled from the point of view of transportation; where they cannot possibly have schools, and where the docks and terminals are so congested at the present time that it is almost impossible to supply them with food. There seems to be absolutely no understanding of the fact that with houses have to go a great many other things, and the result is that a good many of our American cities are face to face with problems which seem to be almost unsolvable. They cannot find the means of extricating themselves out of the difficulty.

Of course a very considerable part of the difficulty lies in the fact that they have allowed their lands to be frightfully capitalized by private owners, and of course all that burden has to be paid in an annual charge. It seems to me it is very much like continuously watering capital stock, and adding water continually to something that produces nothing.

It is one of the great problems in the building business, and several solutions are offered. So far as the United States is concerned it is a problem which we are just beginning to face really seriously.

Of course we are slowly admitting the principle that the community must in some manner find out how to control the use of land. That is why we got our zoning laws, and it was really quite astonishing that New York City should accept the principle of a zoning law, because the zoning law is a restriction upon the use of private property.

Little by little, by police restriction, and zoning restriction, and town planning restrictions, there is developing a common sense view about land, but so far as I can see not much progress is going to be made in the development of our cities or in the supply of housing or the progress of architecture until we as a nation come to accept the principle of some kind of land control.

What this shall be, what is the best kind of control, I am not sure. I do not know that anybody is sure, but when all our minds get working on the problem we shall undoubtedly find some way of solving it. This will mean an absolutely new field for architecture.

The second factor of the building industry with which the Post War Committee labored for a long time is the factor of credit. Almost all of our building operations in the United States depend upon the extension of credit of some kind from some source. Credit, I find, is a very difficult and a very elusive subject to touch, and a very delicate subject to discuss, because there is not any generally accepted definition of credit any more than there is any generally accepted definition of wealth, or any generally accepted definition of money, and the three things are somehow bound up together.

After all credit is some kind of a provision you have to make for paying people while they are doing a certain amount of work. Who supplies that is one question; where it comes from is another question. So far as our conclusions go in the United States the building industry to-day is really dominated by what we have to call the credit monopoly. It is the bankers, the investors, who are really determining mostly the kind of buildings that can be built. It is not the architect, and it is not the contractor, nor is it the workman. It is the man who is supplying the money who tells us the kind of building we can build.

At the present time the people who supply money will not lend any money in the United States. You cannot get a building loan—it is almost impossible. What would happen if credit refused to function in the building industry? It has refused to function for a long time, and the result is we are woefully without buildings, we are very short of houses. What is going to happen if private credit refuses to function? Well, the State of New York has just done a very remarkable thing; it has called a special session of the Legislature to deal with the housing situation in the State of New York. We have the position of a Government body convening for the first time on this side of the water to deal with the housing situation. It has not done anything beyond extending certain help to the renters of buildings. It has not proposed any measures which are going to provide more houses. But, the fact remains that the situation became so serious that the State of New York actually called a special session of the Legislature to deal with the housing problem. It did not call upon the architects, the contractors, the builders and the renters to tell why there are no houses, and I ask you to imagine the State of New York trying to find ways and means for building more houses in the City of New York when 33,000 farms were abandoned in that State last year.

It is a very strange commentary on modern civilization, but there is no disguising the fact that a great city is a great cancer in many ways, and that is the stage to which we are coming in the United States. Our individual problems are gradually being swallowed up in those tremendously big problems with which our communities are faced, and the consciousness of those problems is only just now beginning to dawn.

We have had projects for the city beautiful, and the city square, and the city plan, and so on, and all these were grandiose, but now we are face to face with the tragical problems of transportation, and of schools, and of houses, and the thing is rapidly passing beyond the individual stage, and, as I say, the consciousness of this is only beginning to dawn on us, and we do not know how to meet it.

This again indicates to me that architecture, the Art, is quite helpless. It cannot come to the rescue. It ought to be able to. There is sufficient skill, there is sufficient knowledge, and there are a sufficient number of technicians qualified to solve any of those problems. There is not an architect practicing in Canada or the United States who could not find a solution for it so far as the physical problem is concerned, but, economically, it cannot be done.

Therefore it seems to me that if you are going to look forward to great architectural development, you must examine the economical system, and you must find out why it is that the business of building has been taken away from the architect, taken away from the contractor, and taken away from the workman. The master builder is gone. The whole system is gone. The business of building has passed into the competitive profit-making system, and it is being rapidly taken over so far as the United States is concerned by what we have to call the financial business. We see the great constructing firms everywhere in the United States taking over the entire functions of architect, contractor and builder. A vast amount of building operations is being carried on in that way. You would be astonished if I were to tell you the names of some of the architectural firms who are selling plans to construction companies, their functions ceasing as soon as they have made the plans. Yet, the extraordinary thing is that the architects do not seem to grasp this situation.

Here it is—they are familiar with the land problem; they know how they have to struggle to get loans for buildings; they see those construction companies coming up. Is it not time to look into the system, and try to understand it?

The third factor which enters into the building industry from the point of view from which I am speaking is the question of profits. The building industry to-day is based upon the law of profits—no profits, no building. Of course, no profits, no credit—the two go hand in hand. Is it possible to conceive a building industry carried on without profits, or is it possible that we must forever depend upon the profit-making motive? It seems to me a very curious paradox that when we glorify the men who died in the war as typifying the noblest kind of heroism, giving their lives for something in which they believed without any thought of profit, we should still cling pretty tenaciously to the fact that the profit-making motive is the only impulse upon which we can depend in order to stimulate mankind to do things. I am willing to express my own opinion upon this point, and say I do not believe it. I believe the profit-making motive is a snare and a delusion. I do not know how we are going to get rid of it, and I do not know whether we ever will get rid of it, but I do not believe it is the real motive that inspires any man to do good work—I do not care whether he is workman or king.

I do not believe the profit-making motive is going to survive forever, because it was very curious at the Building Conference in Chicago that a body of forty or fifty men all eminent in the building industry sat in a room and discussed those problems of harmony, and co-operation, and mutual service, and so on, never once mentioning the word "profits."

It is true the building industry, like all other industries, is based upon the law of profits, and I have nothing to say about the man who believes in profits any more than I have to say about the man who does not believe in profits. It does, however, seem very ridiculous to try to discuss the building industry without discussing profits. What is going to become of the profits? Who is going to get them? How are they going to be divided? That is the real problem. And, as for profiteering, what is it? Who can define it? What is a fair measure of profit for any kind of work? Is there any fair measure of profit? I defy anybody to define it.

There are those three things running through the building industry—the business of building—there is the land problem; there is the credit problem; there is the profit problem. It is my hope that this group of men who are working on the matter will be able to make a really serious study of the whole thing, and that they will be able to lay the facts before the industry, and that they will at least begin to make the building industry understand the nature of the machine, how it functions, why it does not function, and what all these things mean. They should not discuss such questions as co-operation, and so on, because those questions are all beside the mark until you have decided what you are going to do about the profits, how much the profits are going to be, and who is going to get them.

That is why I am very much interested in the Building Guilds in England. They have not got very far, it is true. There are about fifty of them in existence at the present time, and two or three of them are working on building projects, one to quite a considerable extent. But, the Building Guilds in England in all their negotiations with the Government and in all their negotiations with municipalities, have clung tenaciously to the principle that they should should carry on their work without any profits. They have offered to supply the labor for carrying out those building operations—of course almost entirely housing. At first they worked on the basis of 10 per cent. to cover the cost of plant, superintendence, and things of that kind. It was not to be distributed as a profit. In the final agreement approved by the Ministry of Health it was reduced to four per cent. They have clung absolutely to the theory that there are to be no profits in what they will do. The workman says: "Give me an acceptable wage, and guarantee me continuous work, and the community shall pay no profits for having its building carried on." Of course, this is a new motive in industry. I do not know how far it will go, and I do not know what fruit it will bear, but all of those things are educational and they all indicate that there is dawning a consciousness of the fact that the building industry does not function primarily in the service of society, but functions primarily in the service of profit-making business.

That really covers the history of what has been happening to the American Institute of Architects since the war, and indicates the line in which I think the majority is travelling. As I said I hope this conference in Chicago will make a really practical, scientific and economic analysis of the business of building, so that architects, contractors and workmen may be made understand what is wrong.

I need hardly dwell on the Trades Union situation. It is the dreadful condition with us in the United States. I should think the most backward trades unions we have are in the building industry. The Post War Committee discovered, and I think we all know, that the quality of workmanship is steadily declining among the trades in the United States, not only since the war, but even before the war, and none of the building trades are drawing to themselves the kind of men they have had in the past. Skilled labor is a very difficult thing to find.

Competent labor is almost impossible to find. This again is another condition with which the building industry in the United States is going to be faced in the future. I do not think anyone knows where the workmen to carry on such operations are to come from. They cannot be found. We have not got them. We have not been training them. We have not been educating them. I suppose the reason is that we have not been offering the incentive.

I have given you roughly this history of what really started with the work of the Post War Committee of the American Institute Committee of Architects, and I have brought you as far as we ourselves have been able to go. I have not the faintest idea of what is likely to develop in the future.

My hope is that more and more architects especially will be willing to look at those things broadly, and impartially, and fearlessly, and try to understand them; because we have quite a different condition at the present time from the conditions which existed when architecture was a great art. We have a great industrial system, a great business system, and a great competitive profit-making system. They are facts. We are living under those conditions, and they must be faced. The matter has to be studied, and I think we must rebuild carefully, slowly, and patiently, because if we do not rebuild in that way the whole structure is likely to collapse which is a thing none of us wants to see.

So, if I have any message at all to the architects of Canada, it is that they concern themselves with trying to get at the real facts and the real truth about the building industry and the going machine.

Inter-Allied Housing and Town Planning Congress of 1920

(*Continued from page* 309.)

an impression, the forms are taken apart and re-erected on the top of the wall just completed.

The success of the work depends on the use of rigid forms, on the freeing of the soil used from larger stones and upon its thorough ramming. The work, it is stated, is extremely easy and can be carried out by unskilled labor.

The cost of the walls for the house built by Mr. Ellis was under £20. The estimate for the same amount of walling in brickwork was over £200.

A brick footing was used in a concrete foundation, but in later buildings the pise wall is built directly on to the concrete.

The exterior walls are whitewashed; the interior being plastered.

I shall always cherish memories of the English countryside in June; it is then altogether beautiful. The manor house with its shaven lawns and mighty oaks; the thatched diamond-paned cottage with its gay profusion of flowers; the grey old church; the village inn—I'm speaking without inside knowledge of the inns—all these make a picture that brings joy to the heart of the architect.

With the great cities, however, it is different. They are frequently grim and ugly, of Liverpool and Manchester in particular I formed this impression. I remembered a story of Judge Parry, then of the Manchester County Court, who had brought up before him a man charged with drunkenness. The Judge asked the unhappy wayfarer why he was drunk, and the man explained that he had been saving up to go away from Manchester, and had then had practically all his money stolen from him, and so in a fit of despondency he had used what remained to get drunk with. "Ah well," said Judge Parry, "perhaps that is the quickest way out of Manchester."

Canadian cities appear brighter and cleaner; they are as yet, at all events, better places to live in than the average English city, but they can only continue to remain so by our taking thought for the morrow in the combined matters of housing and town planning.

O. A. A. Notes

The first business meeting of the new Council of the Ontario Association of Architects was held in Toronto on Tuesday evening, Sept. 21st, with President Moore in the chair. Others present were: Messrs. Allaster, Hynes, McGriffin, Page, Shepard, West and Wickson.

Standing committees were appointed as follows:

Board of Admission—Andrew Sharp, convenor; John M. Lyle, Henry Sproatt.

Editing and Publishing Committee—R. K. Shepard, convenor; F. H. Marani, H. F. Secord, B. Frank Kelly, J. L. Kingston.

Publicity Committee—Joseph Banigan, convenor; Chas. S. Cobb, R. B. McGiffin, Gordon M. West, F. A. Belfry, George T. Evans, John M. Watt.

Architectural Competition Committee — Vaux Chadwick, convenor; Stanley Fryer, Allan George, Gilbert Jacques, A. J. C. Paine, J. M. Watt, Murray A. White.

The following representatives were also appointed:

Canadian National Exhibition—A. Frank Wickson.

Art Gallery of Toronto—William Rae.

College of Art—Stamford Warrington.

Advisory Conference Committee—J. P. Hynes, Forsey P. Page.

Board of Trustees of the G.W.V.A. Club House Fund—A. H. Gregg.

Special Botanical Garden Committee — W. Ford Howland.

Ontario Fire Prevention League—Victor D. Horsburgh.

Joint Industrial Council of the Building Trades of Toronto—J. P. Hynes.

The President called attention to the employment of an U. S. architect to make additions to the Western University at London. In this connection Mr. Hynes' suggestion to interview the Minister of Education was adopted.

The President reported that he had written to the Hon. Sydney Fisher with regard to the competition for the Laurier Monument at Ottawa. This matter was referred to the Competition Committee.

The President laid on the table the correspondence with Mr. Stanley Fryer with regard to the War Memorial at Hamilton.

The President also submitted correspondence with Mr. Willis Chipman with regard to the form of legislation recommended at the convention.

Mr. Shepard submitted Certificate of Membership as drawn by Mr. McDonald, which was approved, subject to slight changes in the wording. The members will be charged $1 each.

A letter was received from Mr. F. V. Johns, Assistant Provincial Secretary, with regard to competition to be held in connection with the British School at Rome. The scholarship will be of the value of £250 per annum for three years. Particulars can be obtained from the Secretary.

A letter from the Royal Architectural Institute of Canada was read stating that Mr. Andrew T. Taylor, late of Montreal, has been appointed on the Special Committee selected by the Royal Institute of British Architects to consider the question of "Unification and Registration," and asking for information. This matter was referred to the Editing and Publishing Committee.

Several cases having been reported to the Council of firms wrongfully advertising as "Registered Architects," it was decided that in every instance where this title is improperly used, attention be drawn to the contravention of the Act by the association's solicitor.

The President was authorized to deal with routine business between meetings of the Council and report at the next meeting.

In the matter of clerical assistance the President, Treasurer and Secretary were authorized to make such arrangements as may be deemed necessary.

Hamilton Meeting

Pursuant to the active campaign of association work decided on at the London convention a meeting of the Council of the Ontario Association of Architects was held at the "Wentworth Arms," Hamilton, on October 9th, with President Moore in the chair and the following members present: Messrs. Hynes, Kelly, McGiffin, Page, Shepard, Watt and West.

An article in the London "Free Press" was read in reference to the contemplated extension at the Western University. The President explained what had been done towards interesting the Provincial Government in the Association's protest against the architectural work for this proposed new building being done outside of Canada. A telegram was read from President D. R. Brown, of the R.A.I.C., endorsing the attitude of the Council in this connection. It was decided to send a letter to the Board of Governors of the Western University, to be prepared by the President and the Publicity Committee.

The Secretary was directed to write to Mr. F. R. Ewart, Secretary of the Advisory Conference Committee, advising that the Council desires further information from various sources before coming to a decision with regards to legislation, and was not in a position to make a definite statement at the present time.

The President reported regarding the Laurier Monument Competition that enquiry had been made as to the names of the assessors, but that no reply had been received.

The Board of Admission report from Mr. Sharp was read, and the following were admitted to full membership: W. C. Chamlers, Ottawa; Jas. S. Russell, Stratford; W. M. Moorhouse, Toronto; J. M. Cowan, Toronto; L. G. Bridgeman, London; W. G. Murray, London.

The Secretary was directed to write the Solicitor, Mr. Grier, to ask as to what action has been taken with regards to non-members of the O.A.A. who are using the title of "Registered Architect."

The matter of more clerical help for the Secretary and a possible small office with telephone was discussed, and left with Mr. Moore and Mr. Wolsey to take up with the Engineers' Club.

The Editing and Publishing Committee reported through Mr. Shepard that CONSTRUCTION had offered to publish a page of association notes every month. This offer was accepted as it was felt by doing so information relating to the affairs of the Association would reach more of the profession than in any other way. The Secretary was accordingly instructed to stop sending out copies of the minutes as has been done recently, as same will appear hereafter regularly in CONSTRUCTION.

The Publicity Committee reported through Mr. West the result of their last meeting. The committee favored the idea of an educational campaign both within and without the association.

Mr. Moore stated at the recent annual assembly of the R.A.I.C. the annual per capita assessment of the provincial associations had been increased from $2.00 to $5.00.

OPEN MEETING.

Following the Council session an opening meeting was held in the evening when in addition to the Council, seventeen Hamilton architects were in attendance.

Mr. Moore told of the objects of the Association and its aims, and explained that the purpose of the meeting was to have the Hamilton Chapter again become active and to have all the Hamilton architects take an interest in the Chapter activities. Various phases of the Association's work with regards to the Industrial Council, publicity campaign and proposed architectural clinic were explained by members of the Council.

The Hamilton architects present were all keenly interested in having the Chapter resume its work, and decided to call a meeting for reorganization on October 12th.

Letter re Western University

On October 9th, an interview quoting Lt.-Col. Walter J. Brown appeared in the London "Free Press in reference to the protest of the Ontario Association of Architects in regards to plans for the Western University extension. The interview is given herewith in part:

"The protest of the Ontario Architects' Association regarding the employment of American architects in preparing plans for Western University buildings is extremely unfortunate.

"The plans prepared for the new university buildings are a gift of a friend of the University, and are designed to enable those interested in the University's development to get a good idea of collegiate-gothic type of architecture, and at the same time to look forward far enough to avoid the architectural blunders which have occurred in the building of other Canadian institutions of higher education.

"The plans are still tentative as they have not been finally accepted by the board of governors. The interior details for library and reading-room space, class rooms and laboratories must, of necessity, be worked out by the teaching staff. The clothing of these designs with form and beauty is the work of the architect. Arrangements are already well advanced whereby competent local architects will be employed to work out the details along similar lines to those followed in the case of the new medical school building.

In reference to the foregoing the following letter was sent by the Council to the publishers of the "Free Press."

October 11, 1920.

To the Editor:

With reference to the statement of Lt.-Col. Walter J. Brown which was published in your issue of Saturday, October 9th, concerning the protest of the Ontario Association of Architects, respecting the reported preparation of designs by foreign architects for the Western University Extension, we wish to point out that having failed by direct effort to obtain information from the University authorities on this matter, we consider it desirable to clearly state our position through the Press.

As Col. Brown, in the article referred to, has taken occasion to characterize our protest as unfortunate, explaining "that the Plans are the gift of a friend of the University, that they are designed to get a good idea of Collegiate Gothic type of architecture, and at the same time to look far enough ahead to avoid architectural blunders which have occurred in the building of other Canadian Institutions of higher education" we consider it advisable in the public inerest, and as a duty to the profession in this country, to issue he following statement.

The Ontario Association of Architects believes:

1. That the Western University, being a Canadian public educational institution, receiving support from the Government of this Province to the extent of some Sixty-five to Seventy-five Thousand Dollars per year, should, in as far as it is possible to do so, pursue the policy in its development that will conserve the resources of the country for development, by the brain power which it produces.

2. That any action which the University has taken, or may take, in entrusting the architectural design of such a Canadian public building to foreign architects, is a direct violation of the economic principles above set forth, and which it, as a University, should be the foremost to uphold.

3. That if we are to have in this country, a national spirit, or a national character, it will never be created or maintained by entrusting its public institutions to those who are not desirous of its inheritance, and to the exclusion of those who, by virtue of citizenship, sympathy, environment and ability, are entitled to paricipate in its welfare and development.

Referring to some of Mr. Brown's remarks, it is not the purpose or intention of this Association to enter into any newspaper controversy on the relative merits of American and Canadian architects, further than to say we believe the work of Canadian architects as reflected in the design and execution of buildings in connection with Toronto University, Victoria University, Knox College, McGill University of Montreal, and several of the recent Western universities, does not suffer by comparison with anything that has been produced on this continent.

The inference which one may draw from Mr. Brown's statement that Collegiate Gothic designs as suggested by photographs published in the Press, and planning of a character to suit the purpose and requirements of the University, can only be successfully carried out by architects from another soil, in conjunction with the University authorities, leaving the execution of the work to local architects, is almost incomprehensible, and leaves us to be "the hewers of wood, and drawers of water."

With all due respect to the opinion represented by Mr. Brown, and to American practitioners (with whom we have no issue), we fail to perceive any just reason why the Board of the Western University should go beyond our borders for the design of the University buildings, furthermore, we cannot be expected to sit passively by and accept such a procedure without strong protest.

We believe that in bringing this matter to the attention of the public, we are acting in the best interests of the University, of the citizens of London, and the country at large.

Signed on behalf of the Council of the Ontario Association of Architects.

R. B. WOLSEY,
Secretary.

Toronto Chapter Luncheons

Luncheon meetings were held at the Hotel Mossop on Sept 20th and 30th by the Toronto Chapter of the Ontario Association of Architects. Nineteen members attended the first luncheon and thirteen the second, with Mr. Horsburgh presiding on the two occasions.

At the first meeting Mr. Hynes introduced the subject of the steel workers strike and explained the working of the Joint Industrial Council of the Toronto Building Trades. A committee was appointed to endeavor to influence the contractors involved to settle their difference through the Joint Industrial Council.

At the second meeting Mr. Shepard spoke on the starting of a free architectural clinic to reach those who were building their own homes and who would not likely come to an architect. A committee of Messrs. Shepard, Dolphin and Lee was appointed to get in touch with the G.W.V.A. to explain the purpose of the clinic and the service which the Association aims to render.

A letter was read from Mr. Somerville as follows:

September 29th, 1920.

As I am unable to be at the luncheon to-morrow, I am doing the next best thing; writing to tell you what my idea was regarding the question of establishing an Atelier. Briefly it can be stated as follows:

PURPOSE: (a) For the training of the younger men who have entered offices directly from the technical high schools and who are unable to take the university course. This training to be under the direction of experienced practitioners, in order to develop these men into skilled, proficient draughtsmen in the shortest possible time. (b) To give those men, who have enough ambition and energy to want to improve themselves an opportunity to do so, without leaving the country and depriving the Architects of the services of the best type of draughtsmen.

BENEFIT TO ARCHITECTS: By developing the usefulness of juniors making them more available. Most boys coming from high school are under the impression that they can make drawings. In most cases they have an elementary idea of what is required and with a little training in the purely manual preparation of drawings would be doubly valuable. This with the knowledge of design gained by the atelier training is as valuable to the architect as it is to the draughtsman.

Will keep the better types of draughtsman in Canada and they will be trained according to the ideas of Canadian architects. At the present time the large majority of our architects receive their training in the offices of American architects, American colleges, and the ateliers of France or the United States. Will the Government or the general public ever do anything to remedy this if the architects themselves do nothing but howl about it and ask some one else to do something?

We have got to have a decent University course; we cannot provide that ourselves; but we can help the men in our own offices and largely to benefit ourselves, establish an Atelier for the improvement of our junior draughtsmen.

Mr. Hynes opposed the idea at the last meeting on the plea that it would interfere with his pet idea of legislating the entire Association into Utopia where no American architects, engineers or other undesirables can obtain admission. All support to his efforts, his good work should be properly appreciated by us all, but in the meantime let us do something for those men whom his educational programme does not cover. There is surely no danger of having too many highly trained draughtsmen.

I was glad to learn that this question had been brought up before by Mr. Cobb. I understand he is willing to devote a portion of his time to it and has already taken the matter up with some of the draughtsmen. If an Atelier is established we will all be benefited by it and it seems only just that the Association should stand back of it.

I might add that I am one of a number of men grateful to John M. Lyle for his tireless efforts in starting an atelier in Toronto a number of years ago.

Yours very truly,
(Signed) W. L. SOMERVILLE.

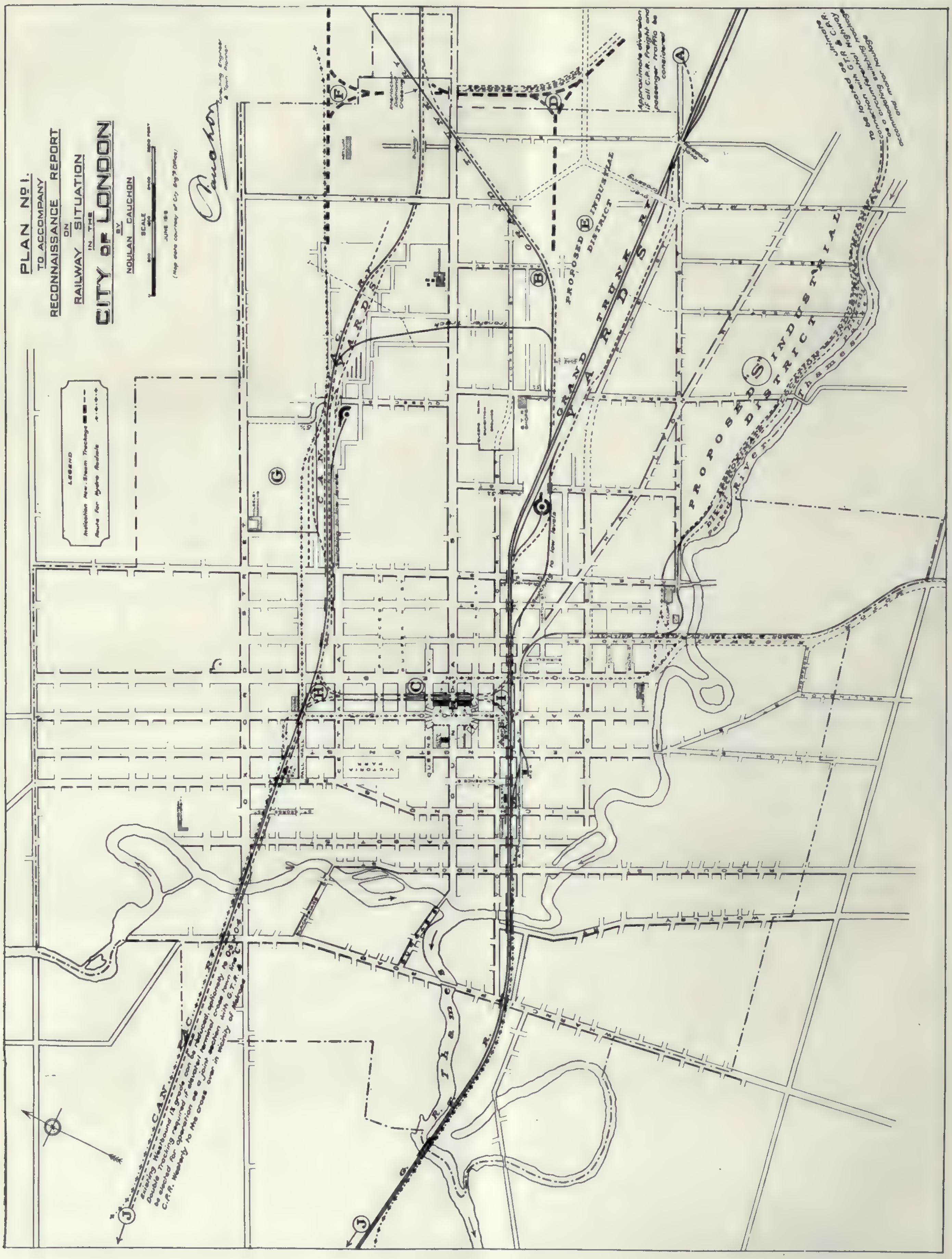
The feeling of the meeting was that such an atelier should be started now, but definite action was deferred until the next meeting.

The Latest at Greenwich Observatory

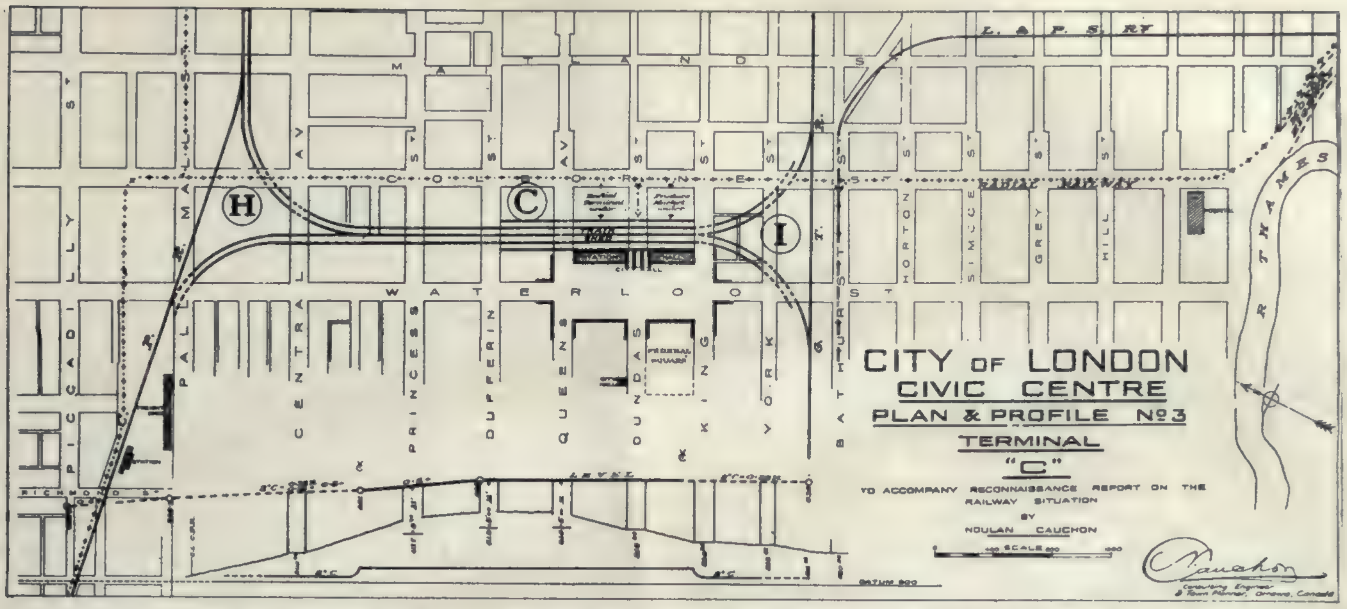
Once every year a rather quaint ceremony is observed at Greenwich Observatory. An inspection of the Observatory is made by a "Board of Visitors" to whom the Astronomer-Royal presents a report on the work of the preceding twelve months. The latest reports shows that although the Observatory was founded centuries ago, at the very dawn of scientific navigation, it keeps in line with the latest developments. A new aerial has been erected to extend the range over which wireless time signals can be received. These signals are now received regularly from the Eiffel Tower, Nauen, and Annapolis. The Observatory also controls the operation of time-balls in different parts of the country. These time-balls are hoisted on a prominent mast and released at specific hours by an electric signal from the observatory. The accuracy of the operation is checked by a return signal from the distant time-ball. Greenwich also controls "Big Ben," the famous clock of the House of Parliament, London.

◆

Jade, though little used by Europeans, is still prized by the Chinese and other Asiatics, and is especially notable for its extensive use in every continent in prehistoric times. Ornaments and utensils of this stone are found among the lake dwellers of Switzerland, the ancient peoples of France, Mexico, Central America, Greece, Egypt and Asia Minor.



PLAN ACCOMPANYING RECONNAISSANCE REPORT ON THE RAILWAY SITUATION AT LONDON, ONTARIO.



PROPOSED CIVIC CENTRE AND UNION TERMINAL FOR LONDON, ONT., RECOMMENDED IN THE CAUCHON REPORT.

Synopsis of Cauchon Report on Railway Situation in the City of London, Ont.

THE following is a synopsis of Mr. Naulon Cauchon's report on the railway situation in the City of London, Ont., and formed the basis of an illustrated address delivered by Mr. Cauchon personally at the luncheon tendered jointly by the City Council and the Chamber of Commerce to the visiting architects at the recent convention of the Ontario Association of Architects held in that city.

The essential features of the scheme and the nature of the improvements contemplated are indicated in the two accompanying plans.

The idea of having one railway entrance and the elimination of others, one union terminal company for all freight and passengers, is implied—but, in view of Parliament having withheld full power from the Railway Commission to deal with existing terminals; of the railways being free in the matter of negotiations and of their constitutional disinclination to merging identity, etc.; of the limited size and financial strength of London to bear its probable proportion of such a scheme as would involve the total abandonment of the C.P.R. for over ten miles; or of diverting only the passenger service and the disability to the C.P.R. of having, notwithstanding, to elevate its main line on account of freight traffic, an alternative has been submitted known as Union Terminal "C."

The full elevation of the main lines of the G.T.R. and the C.P.R. is recommended, from Adelaide Street westerly to and beyond the river; Adelaide Street and easterly to be partially elevated and the streets to be proportionately subwayed. This means the complete elimination of all level crossings in London on all running tracks; the industrial tracks to remain on surface level with switching regulated and protected.

From 1900 to 1918, inclusive, there were twenty-eight people killed and seventy injured on the level crossings.

Two extensive industrial areas to be municipally owned, capable of expansion, have been selected and trackage proposed to give access to them from both railways and freedom from all inter-switching charges. These industrial areas are adjacent to main sewers and public utilities.

If London is to enjoy a Union Terminal for passengers, the Engineer and Town Planner thinks that the solution lies in a line elevated for three-quarters of a mile across the city connecting the G.T.R. and the C.P.R. elevated main lines. This terminal is to be municipally owned but leased to a terminal company in which the two railways would be equally represented, and be operated with the G.T.R. and C.P.R. main lines westerly as far as "Melrose Junction," as a "joint section" for passenger business only.

A Civic Centre is proposed at the intersection of Dundas and Waterloo Streets with the latter enlarged to form a spacious square, upon which the new terminal station would face, right in the heart of the city and at the almost exact centre of its population. The Civic Centre Square is to be created by taking one row of lots for two blocks on each side of Waterloo Street. This traffic square would be about 1,100 feet on its long axis north and south, and about 370 feet wide on the axis of Dundas Street, containing over nine acres, of which about 60 per cent.

would be composed of already existing street areas. About four acres only are required to be purchased. There would be eight streets, each 132 feet wide, leading out of this square.

It is also proposed that the new City Hall be built directly on the axis of Dundas Street, facing upon the Square; the traffic to pass under the Civic and Station buildings by wide arches.

Recommendations are made for the removal of the Asylum and also the Barracks from where they block street extension and development, to sites outside on the city-owned London and Port Stanley electric railway, this also aiding in the building up of this latter holding.

Provision has also been made in the plan for all future steam or hydro-radials to use the common entrances of the scheme free from level crossings, and thus avoid any further cutting up of the city by new rights of way.

Many other co-related features of the city's enhancement are analyzed and provided for, which will prove most interesting to the citizens of London and to those of other cities and towns which are facing railway and development problems.

This reconnaisance report on London was made by Mr. Cauchon for the London Chamber of Commerce as an indispensable preliminary to the further advance of the general town planning which they favor. Speaking at the luncheon, Mr. Cauchon recommended that the report be published in full in pamphlet form for the citizens' information and judgment.

The proposal was subsequently endorsed by the architects attending the convention, and resulted in the passing of a resolution recommending its adoption to the city, the feeling being that it would assure a systematic and beautiful development of the city.

Electric Cooking for the British Worker

Electric cooking apparatus in Great Britain is finding its way into the working class dwellings constructed under the numerous "housing schemes" undertaken by local authorities or by private enterprise. In one large colony every house is being equipped with an electric cooking range, two electric fires and an electric copper for washing purposes. There is only one chimney in the house, an open-fire being used for burning refuse and also for warming (by means of a boiler at the back of the fire) the water for baths and other uses. The construction of the houses, it is said, is so much simplified by the use of electric cookers and heaters that the total cost, including all the electrical appliances, is less than that of a similar house built in the ordinary way. Electric light is, of course, installed. The electric ranges are large enough to cook ordinary workmen's meals for seven or eight persons.

STORE AND OFFICE BUILDING, BLOOR AND NORTH STREETS, TORONTO.
C. J. GIBSON, ARCHITECT.

CONSTRUCTION

A · JOURNAL · FOR · THE ARCHITECTURAL
ENGINEERING · AND · CONTRACTING
INTERESTS · OF · CANADA

H. GAGNIER, LIMITED, PUBLISHERS
Corner Richmond and Sheppard Streets.
TORONTO - - - - CANADA

M. B. TOUTLOFF, Editor
W. H. HEWITT, Advertising Manager.

BRANCH OFFICES:
MONTREAL—171 St. James Street,
E. R. Milling, Representative.
WINNIPEG—336 Qu'Appelle Street,
F. C. Pickwell, Representative.
NEW YORK—505 Fifth Avenue.
H. M. Bradley, Representative.

CORRESPONDENCE.—All correspondence should be addressed to "CONSTRUCTION," Corner Richmond and Sheppard Streets, Toronto, Canada.

SUBSCRIPTIONS.—Canada and Great Britain, $3.00 per annum. United States, the Continent and all Postal Union countries, $4.00 per annum, in advance. **Single copies, 50c.**

ADVERTISEMENTS.—Changes of, or new advertisements must reach the Head Office not later than the twentieth of the month preceding publication to ensure insertion. Mailing date is on the tenth of each month. Advertising rates on application.

CONTRIBUTIONS.—The Editor will be glad to consider contributions dealing with matters of general interest to the readers of this Journal. When payment is desired, this fact should be stated. We are always glad to receive the loan of photographs and plans of interesting Canadian work. The originals will be carefully preserved and returned.

Entered as Second Class Matter in the Post Office at Toronto, Canada.

Vol. XIII. Toronto, Oct, 1920 No. 10

The Toronto Architects Clinic

The gratuitous offer of the Toronto Chapter of the Ontario Association of Architects to conduct an architectural clinic for the benefit of the small house builder, is indeed to be commended. There is in the heart of every community workmen and other individuals who desire to own and live in their own homes, but whose means will not permit them engaging the services of an architect. They invariably get out rough plans themselves and build the best they can, and it represents a class of work which never comes to an architect's office. It is for the purpose of assisting such individuals that the proposed clinic is being inaugurated. The intention as we understand it is to hold these clinics under proper neighborhood auspices, at which free architectural advice will be given to small investors submitting their own plans.

In doing this the architects will not only be rendering a real service to the owners of small homes, but to the community at large, in that it will result not only in better consideration being given to the designing and planning of such dwellings, but will to a large extent prevent the erection of that class of structures which has too often proved detrimental to neighborhood development.

The proposal has reached the stage where it has been submitted to the Toronto branch of the Great War Veterans Association and has met with full acceptance from that body. The principle in a more direct way follows a similar movement in the United States where under the direction of the Minnesota Chapter of the American Institute of Architects a periodical is being published, containing advice to small house investors, together with sketches and plans of which blue prints can be obtained for a small sum. A similar publication might eventually be started here in Canada, but much will depend on the spread of the clinic idea to other cities, as well as the time and co-operation architects elsewhere might be willing to give in furthering a more general movement along these lines.

THE ROYAL ARCHITECTURAL INSTITUTE OF CANADA.

Montreal, Que., October 7, 1920.

Editor, "Construction":

Dear Sir,—I beg to inform you that at the last session of the Thirteenth General Annual Assembly of the Royal Architectural Institute of Canada, held at Ottawa, on the 1st and 2nd October instant, a special vote of thanks was unanimously adopted to be sent to you for your generous co-operation in making such a success of the Assembly.

Yours very truly,
(Signed) ALCIDE CHAUSSE,
Hon. Secretary.

Toronto Builders' Exchange Reorganized

Members of the Toronto Builders' Exchange held a recent meeting in the Board of Trade rooms in the Royal Bank Building to deal with the proposed reorganization of the Exchange, which had already been submitted to them in the shape of a new constitution drawn up by the board of directors and business manager Reynolds. With some changes in the constitution and by-laws the reorganization as proposed was endorsed by the meeting.

The name of the exchange was altered to "The Builders Exchange and Construction Industries of Toronto." This change was made to make it more inclusive in character so as to take in all supply firms and branches of the contracting business.

As a result of reorganizing it is felt that the Exchange will be able to adopt a more progressive policy. The obect is to make it a more useful and influential organization, and to bring it up to the highest point of service to both its members and the public. Among other things an endeavor will be made to establish trade schools for artisans in the industry, and to promote concerted action in reference to the question of labor and related problems. There is also a possibility that some effort will be made to induce the Board of Control and the Board of Education in reference to schools and civic buildings to have plans and specifications submitted to the Exchange for constructive criticism. It is felt that if this is done certain economies in construction could be effected with a corresponding financial saving to the city.

◆

New Associate Professor at U. of T.

During the past month the staff of the University of Toronto has been increased by the arrival of Professor Adrian Berrington, who is assuming the duties of Associate Professor of Architecture in connection with the School of Practical Science. Prof. Berrington, who has had a wide experience in both France and England, comes direct from Paris, and has a distinguished war record to his credit, having served five years (less two months) and being wounded twice. His addition to the university staff is in accordance with the policy announced some time ago by Dean Mitchell, which aims to substantially improve the present course offered to architectural students.

◆

Crouse-Hinds Company to Build

In order to more adequately meet the demand for their well known products, the Crouse-Hinds Company have purchased a five acre site with track facilities for the erection of a large new modern plant at the corner of Hanson St. and Coxwell Ave., Toronto. The main building of the new plant will be 500 x 80 ft., and either three or four storeys high. In addition to this a foundry, 300 x 60 ft., will be erected, together with a fireproof pattern warehouse approximately 100 x 100 ft., and two stories high. The buildings will be of the modern daylight type, of brick and mill construction and will be equipped with sprinklers throughout.

Plans and specifications are now in course of preparation and ground will be broken about May 1st, so that the plant will be ready for occupation in November, 1921. The plant will cost $500,000 for buildings alone and when completed will be occupied jointly by the Harvey Hubbell Company, the Hubbell-Mack Machine Screw Company and the above concern. This will make three plants that the company will have under operation in Toronto, the other two being factory No. 1 on Labatt Ave., and factory No. 2 on Carlaw Ave., all of which will be under the supervision of Mr. E. G. Mack, managing director of the three companies.

The Cylindrical House

The house can be no wider than its lot, but it may be wider than its foundation, and roomier by several feet than the dimensions of its side would betoken. In proof of this a Kansas City man has built a 22-foot house on a 25-foot lot, and has seven feet of yard left—three and a half feet on each side. He accomplished this remarkable feat by making his house cylindrical. Far from sacrificing any element of beauty to the unusual design, the appearance of this novel dwelling is entirely pleasing, outside and in, says the "Western Contractor." The foundation measures 18 feet wide by 36 feet long, with its walls vertical up to the swell of the cylinder. The basement windows are round port holes giving a nautical effect, and perched in the centre of the room, like a turret, is a little sleeping porch. The roof itself is a segment of a cylinder, extending over the front porch. Inside are four good-sized rooms and a large hall, which serves as a spare room by virtue of a built-in bed, occupying the curve of the wall.

◆

CONTRACTORS and SUB-CONTRACTORS

ADAMS FURNITURE COMPANY'S BUILDING, TORONTO.

General Construction, Frid Construction Co.
Brick, Sun Brick Co.
Plumbing, Purdy, Mansell Co.
Heating, Purdy, Mansell Co.
Sprinklers, Purdy, Mansell Co.
Steel Sash, Henry Hope & Sons.
Elevators, Turnbull Elevator Co.
Steel Work, Toronto Steel Construction Co
Cast Iron Columns, Hepburn & Disher.
Painting, Fred. Roberts Co.
Plate Glass, Consolidated Plate Glass Co.
Store Front, Consolidated Plate Glass Co.
Roofing, Canadian Johns-Manville Co
Sheet Metal Work, Douglas Bros.
Kalamied Door, Douglas Bros.

HOBBERLIN BUILDING, TORONTO.

General Contratcors, Yolles & Rottenberg.
Brick, Don Valley Brick Co.
Window Construction, A. B. Ormsby and Co.
Electric Fixtures, MacDonald & Wilson.
Electric Wiring, Canada Electric Co.
Elevators, Otis-Fensom.
Expanded Metal, Trussed Concrete Steel Co.
Fire Doors, Robert Olsen.
Flooring, Mastic, H. H. Symons.
Glass, Toronto Plate Glass Co.
Heating System, C. A. Dunham Co.
Marble, Italian Mosaic and Tile Co.
Plumbing, Marlson and Buchanan.
Reinforcements, Trussed Concrete Steel Co.
Radiators, Dominion Radiator Co.
Roofing, Carmichael Waterproofing Co.
Stone, Natural, Peerless Art Stone Co.
Structural Iron and Steel, Toronto Steel Construction Co.
Tiling, Italian Mosaic and Tile Co.
Vault Doors, Taylor Safe Works.

PRINCE'S LIMITED, TORONTO.

General Contractors, Holtby Bros.
Plumbing, Bennett & Wright.
Decorating, Murray-Kay.
Torrano Flooring, Toronto Sanitary Flooring Co.
Ventilating Fans, Sheldons Limited.
Plastering, Andrew Petrie.
Store Fronts, H. J. St. Clair.
Plate Glass, Toronto Plate Glass Importing Company.

J. P. Anglin, B.Sc., *President.*
H. J. Gross, *Vice-Pres. & Treas.*
C. D. Harrington, B.Sc., *Vice-Pres. & Manager.*

ANGLIN-NORCROSS LIMITED

CONTRACTING ENGINEERS
AND BUILDERS.

MONTREAL TORONTO HALIFAX

CONSTRUCTION

Toronto, November, 1920 Vol. XIII., No. 11

CONTENTS

NEW THEATRES, TORONTO 339

THE SUSPICIOUS CLIENT 346

BATTLEFIELD MEMORIALS 350
An address by Percy E. Nobbs, M.A., F.R.I.B.A., R.C.A., delivered at the recent R.A.I.C. Assembly.

R.A.I.C. COUNCIL PROCEEDINGS 355

NEW NURSES' HOME, ST. MICHAEL'S HOSPITAL, TORONTO 358

COMMUNITY DEVELOPMENT 360
An address by Dr. C. A. Hodgetts, Department of Health, Ottawa, delivered at the recent R.A.I.C. Assembly.

O. A. A. NOTES 362

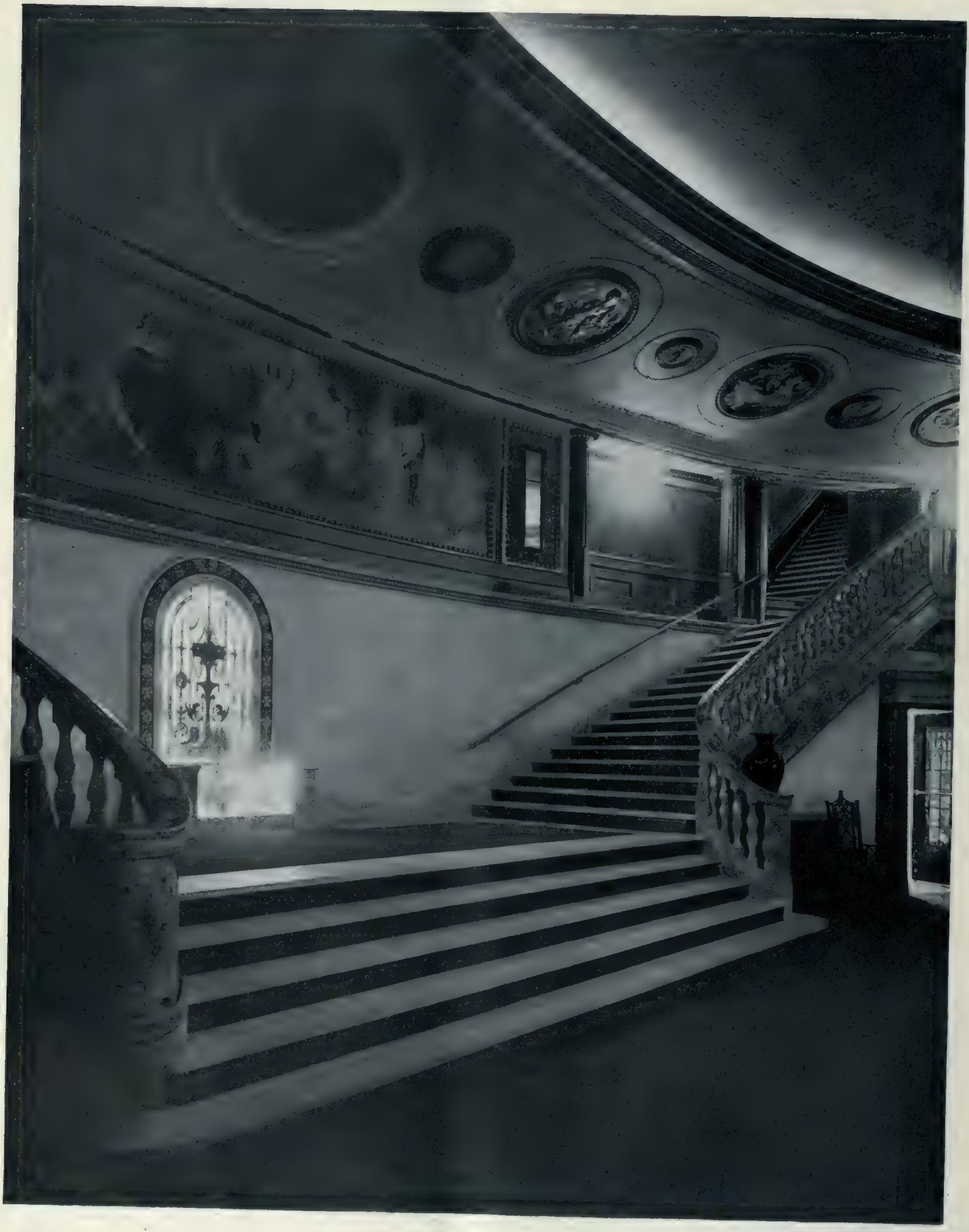
STUDENTS' WORK, TORONTO TECHNICAL SCHOOL 363

EDITORIAL 367

Frontispiece

GRAND STAIRCASE, NEW PANTAGES THEATRE, TORONTO 338

H. GAGNIER, Limited, Publishers
GRAPHIC ARTS BLDG., TORONTO, CANADA
BRANCH OFFICES
MONTREAL NEW YORK



GRAND STAIRCASE

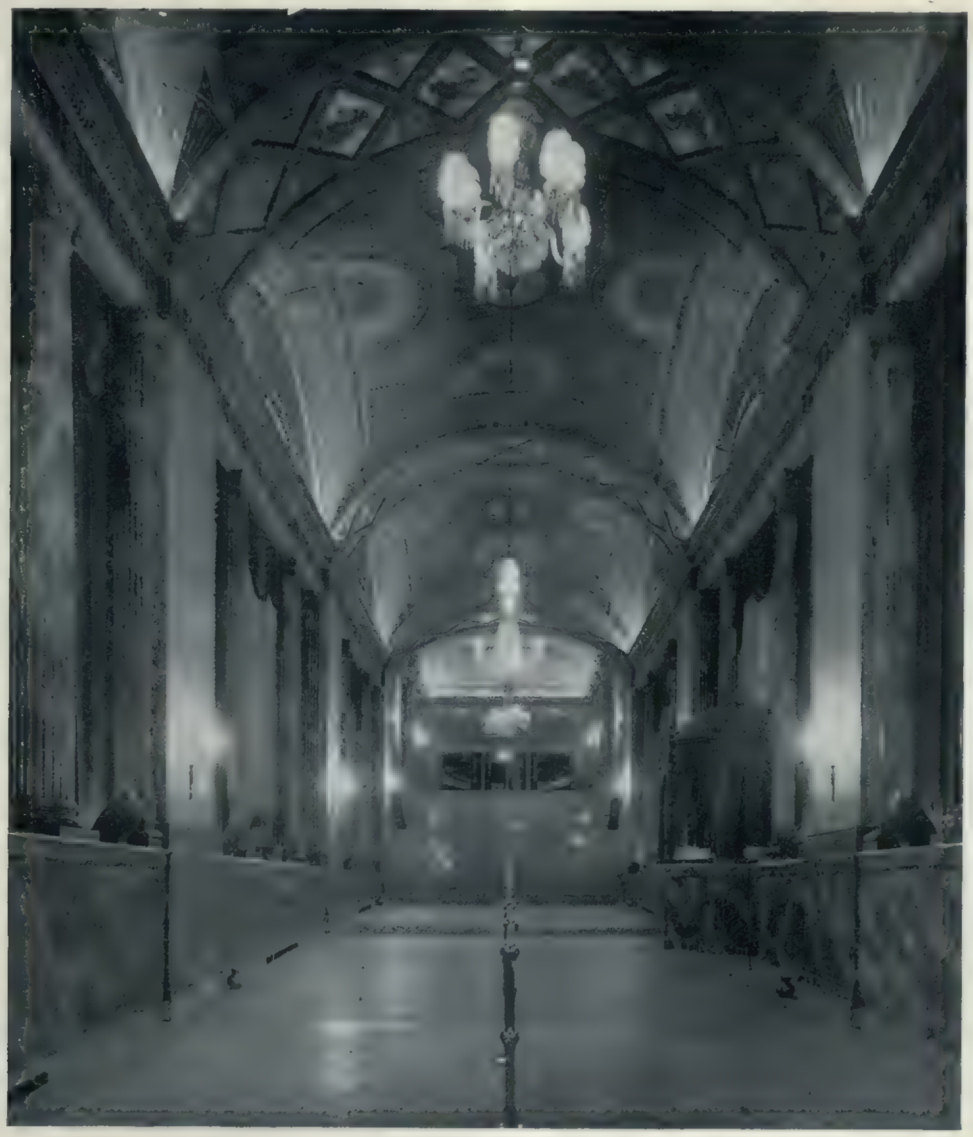
NEW PANTAGES THEATRE, TORONTO.

THOS. W. LAMB, ARCHITECT.

New Toronto Theatres

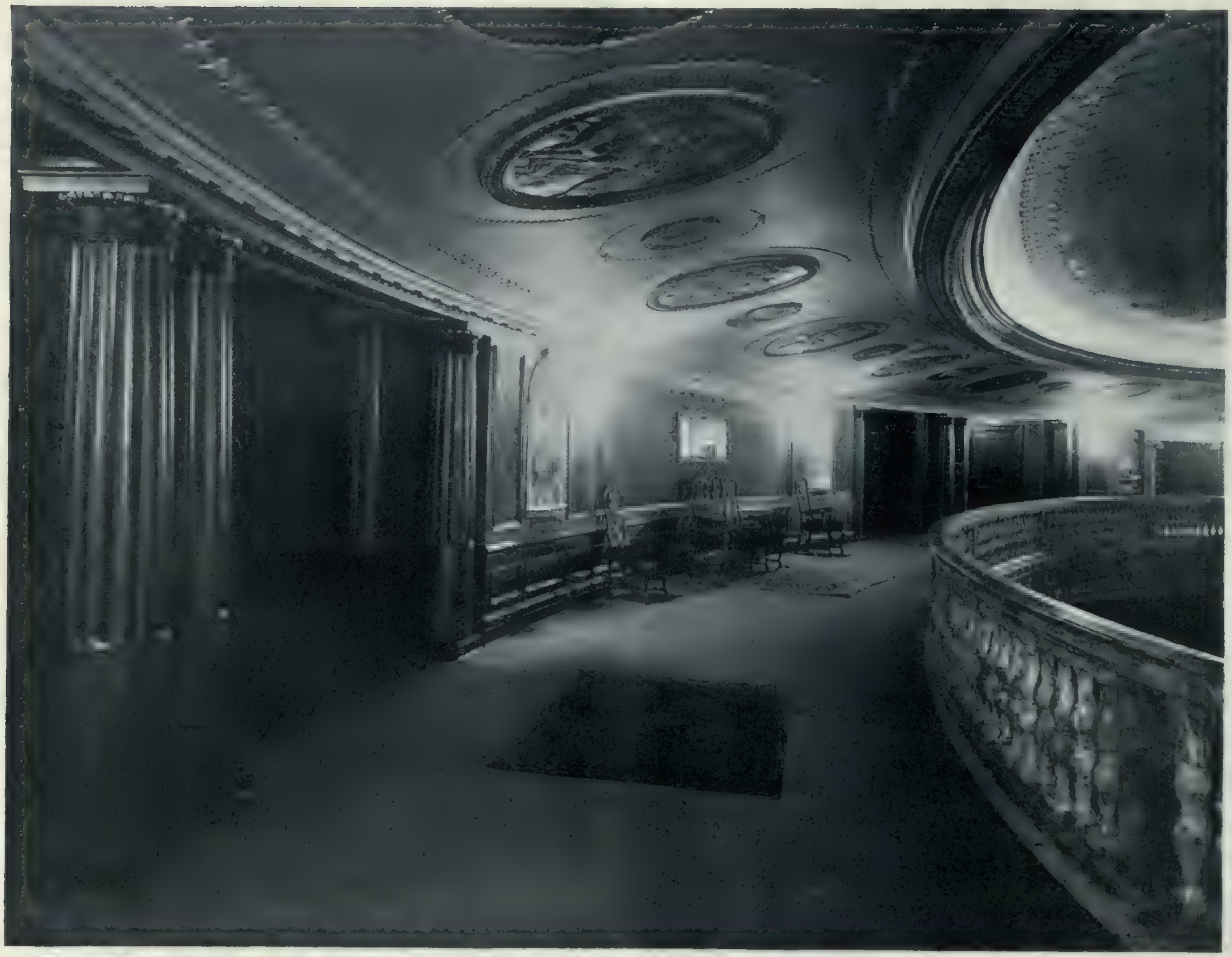
IN keeping with her architectural growth in other directions, and perhaps more so than any other Canadian city, Toronto has witnessed a development as regards theatre construction which can best be realized by taking into account the fact that as recent as a decade ago the city could boast of but five playhouses. Since then seven large downtown theatres have been built in addition to a dozen or more of high-class movie houses, not to include innumerable lesser houses devoted to the latter purpose which are now scattered throughout the city.

The Pantages and Loew's Uptown, recently opened, are the two latest to be added to the list, and are both quite deserving of the encomiums which have been bestowed upon them by the theatre-going public. The former is Canada's largest playhouse, and the latter what is termed Toronto's movie house de luxe. Both show a very successful solution of two like problems differing in certain essentials of arrangement and decorative treatment. The similarity which exists is found mainly in the character of the facades in that in keeping to a large extent with the tendency in modern theatre construction, wide street frontages have been avoided. In other words the exterior in either case mainly serves to give entrance to the lobby connecting with the auditorium and is principally denoted by embellishment of line and external electrical effects.

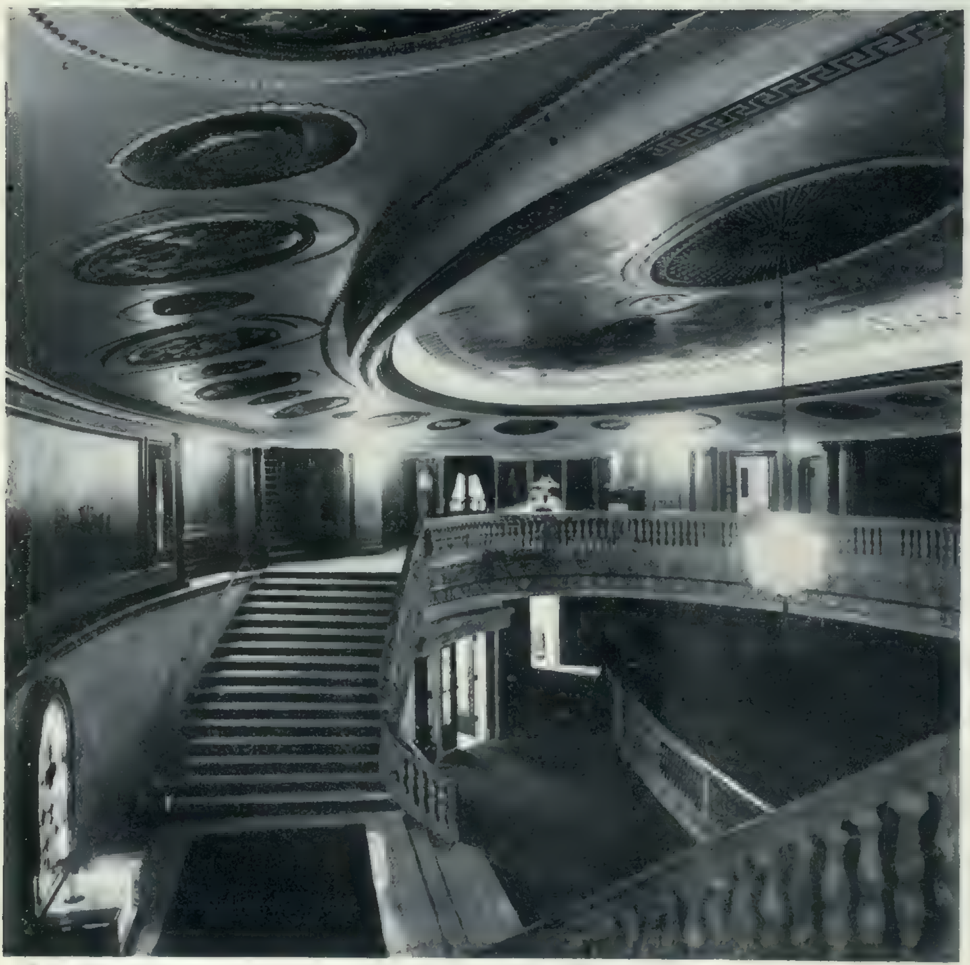


ENTRANCE LOBBY: NEW PANTAGES THEATRE, TORONTO.

Each of the two playhouses, in fact, has its own distinct individuality, the respective schemes being so consistently marked with good taste that one instinctively feels a faith in all that has been said of the positive psychological effect of good architecture upon its beholder. The accompanying photographs by no means do justice to the subjects in that they fail to register the color harmony which exists and on



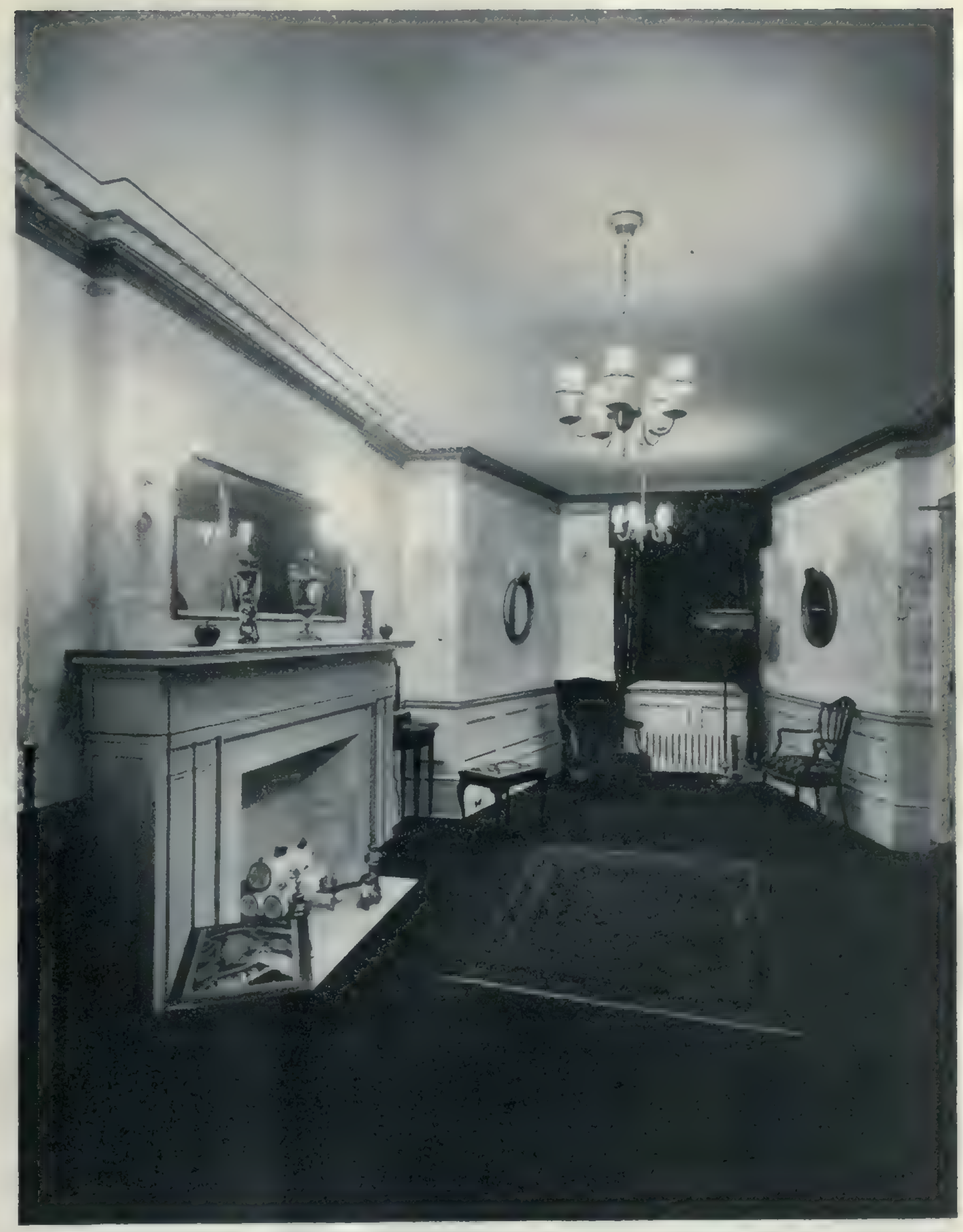
MEZZANINE
PROMENADE



NEW
PANTAGES THEATRE
TORONTO

THOS. W. LAMB,
ARCHITECT.

GENERAL
MEZZANINE VIEW



LADIES RETIRING ROOM: NEW PANTAGES THEATRE, TORONTO.

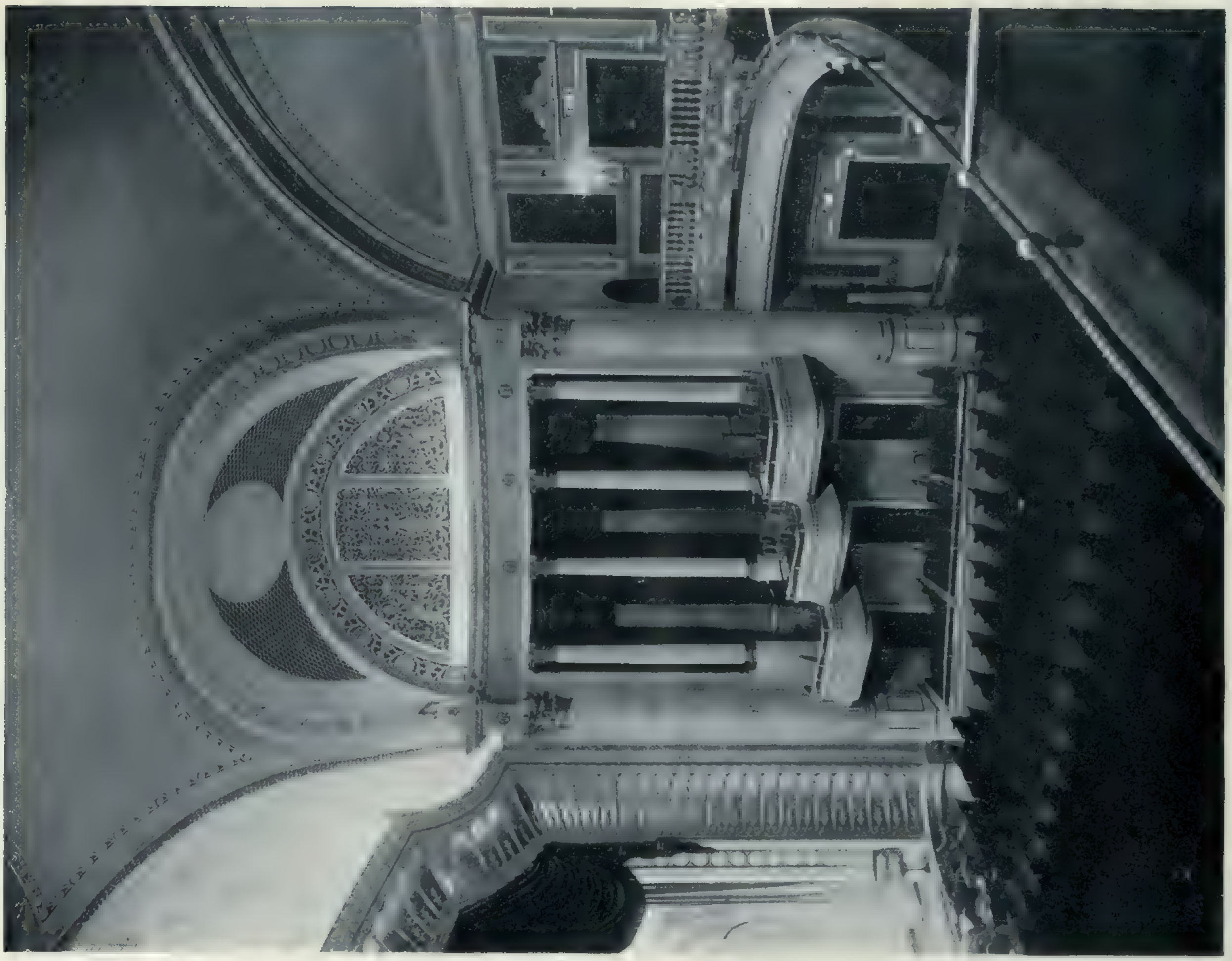
which much of the success depends; but they will at least suffice with a brief description to familiarize the reader with the general character of both houses.

The entrance of the new Pantages is located on Yonge Street, between Shuter and Dundas, in the heart of the shopping district, where an open vestibule leads to a spacious lobby elaborately decorated in the Adam style, with Ionic columns forming the divisions of the mirrored walls and rich draperies giving to the whole an intimate touch. The lobby itself is 22 ft. wide by 120 ft. long. Immediately at the rear a flight of marble steps give access to the mezzanine promenade which is likewise tastily carried out and forms the focal centre of the service of the theatre. Retiring rooms are provided off this promenade for both sexes, and from it access is obtained to both the balcony and the marble staircase leading to the main floor of the auditorium. This stairway descends in an elliptical well which gives the effect of extreme height to the rear of the house.

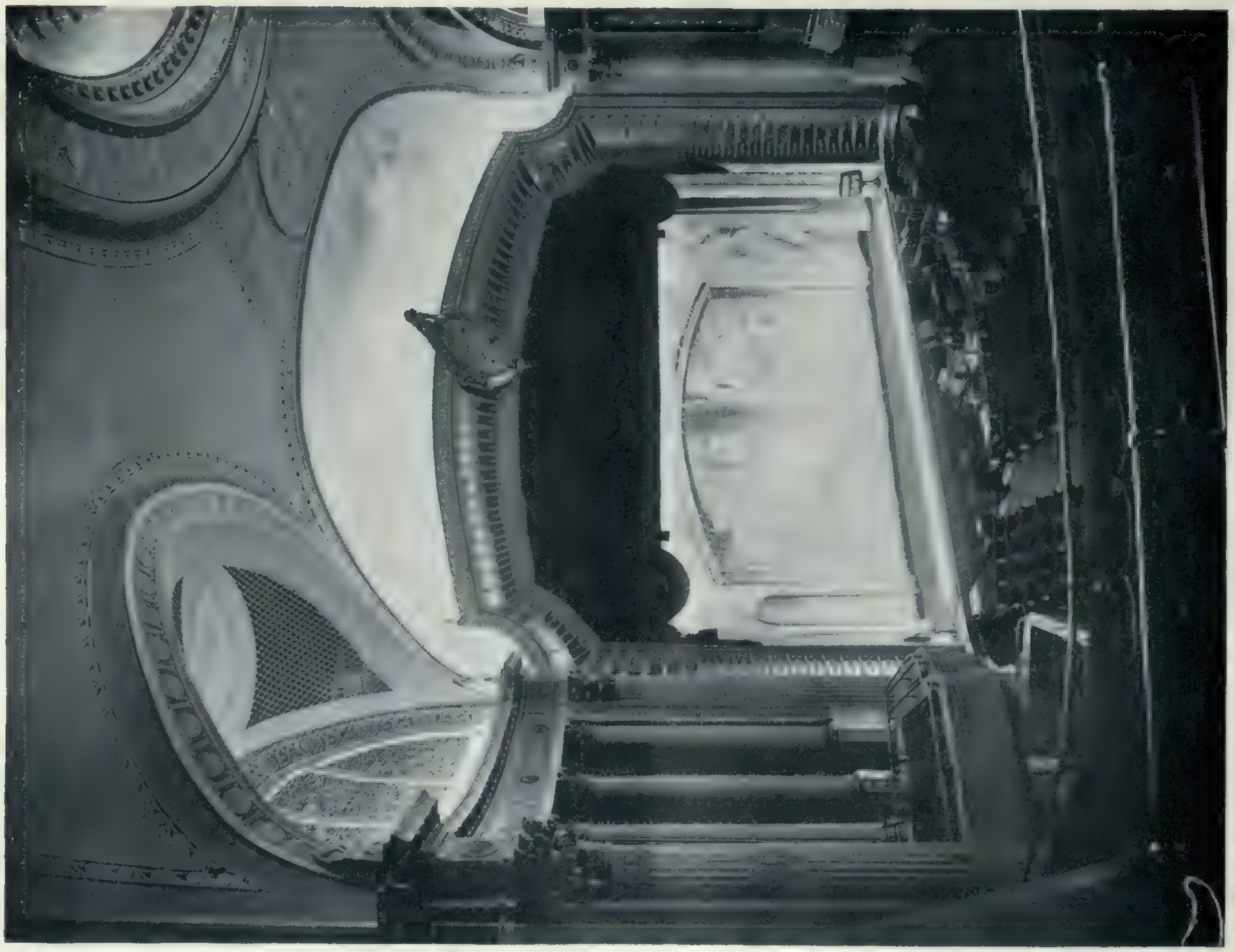
The auditorium proper also borrows from the Adam period and is decorated in general tones of blue and gold. Considerable study was given to the color scheme to eliminate the possibility of a cold feeling in the house due to the blue in the draperies and silk wall covering. An effect of warmth was obtained by the addition of gold to the blue, and by the use of warm colors in the decorative painting. This auditorium has the distinction of being the largest of any in the Dominion, containing 22,500 square feet, and seating thirty-five hundred people. One feature of the scheme is the organ, located behind plaster screens in the side wall of the auditorium near the stage, with an additional echo organ in the space above the main ceiling near the rear of the house. There is also a broad promenade at the rear of the main floor with additional retiring rooms for both men and women, while a separate entrance from Victoria Street direct to the auditorium has been provided primarily for the accommodation of motorists.

The successful designing of a theatre, however, implies more than plan and decoration. Patrons must be able to see and to hear what is going on from all parts of the house. In both the Pantages and the new Loew's this important necessity has been most carefully considered and the acoustics and sight lines are so worked out as to leave little to be desired. Likewise especial care has been given to the design of the ventilating apparatus, the fresh air being brought it from the outside, washed and tempered, and forced through ducts into the auditorium and then expelled through vents in the ceiling.

The latter house is the pioneer of large theatres in uptown Toronto. The entrance is on the west side of Yonge Street, a few doors south of Bloor. The character of this theatre is similar to the other Loew houses in Canada. An open vestibule leads to the outer lobby which



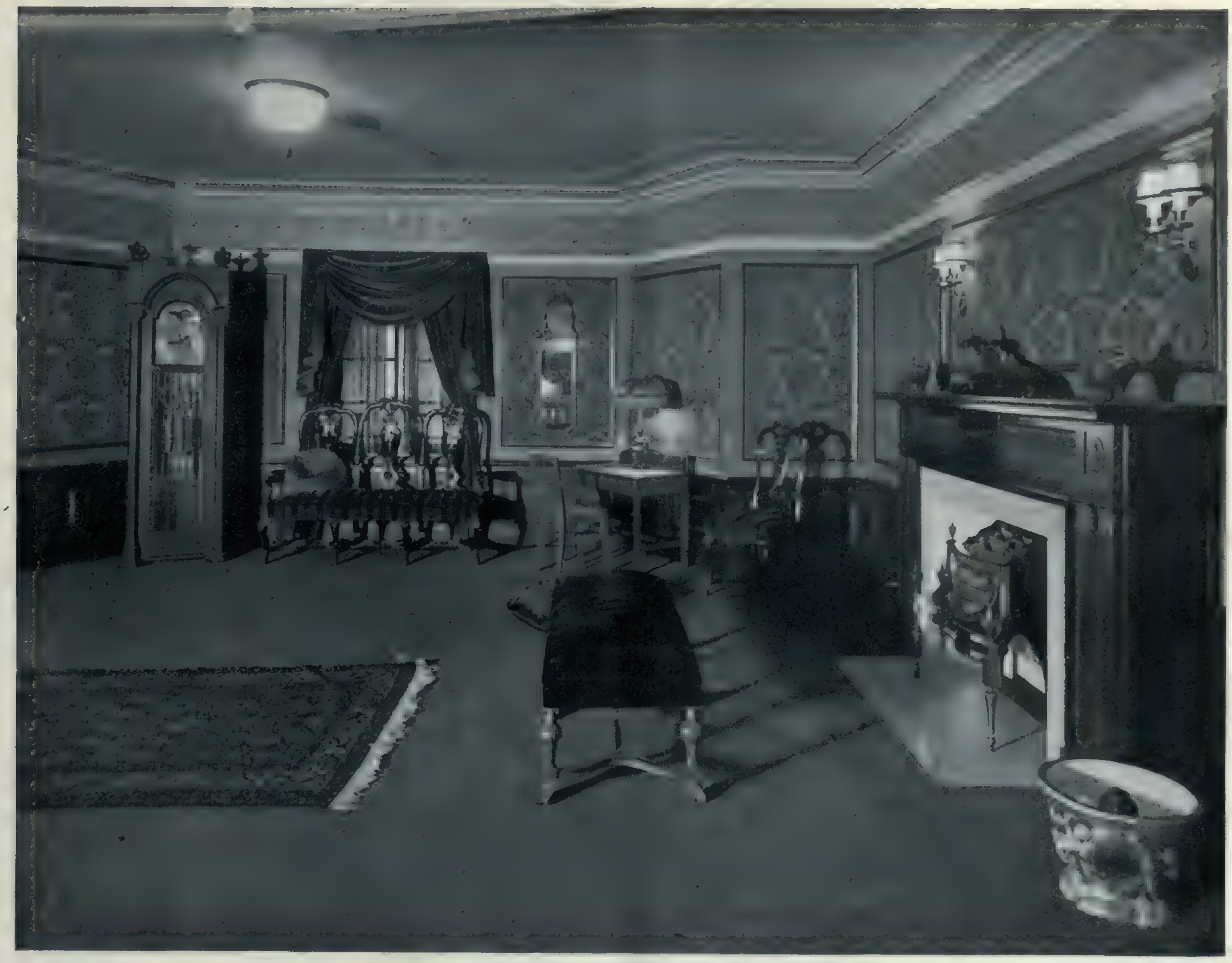
DETAIL OF BOXES.



DETAIL OF PROSCENIUM ARCH.

NEW PANTAGES THEATRE, TORONTO.

THOS. W. LAMB, ARCHITECT.

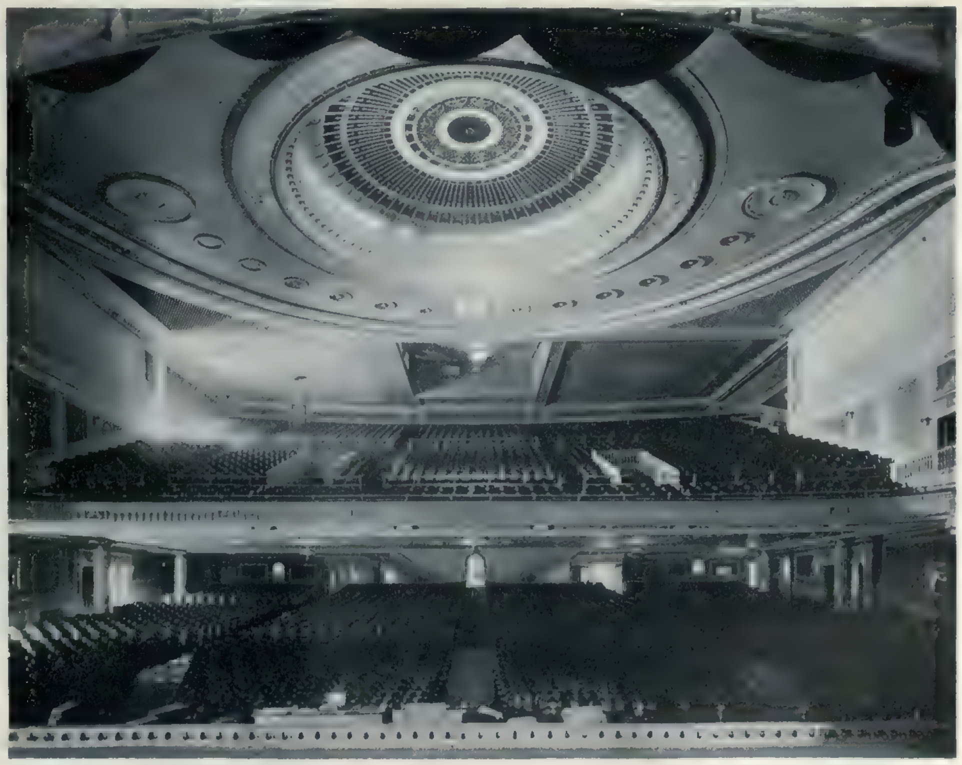


LOUNGE ROOM: NEW PANTAGES THEATRE, TORONTO.

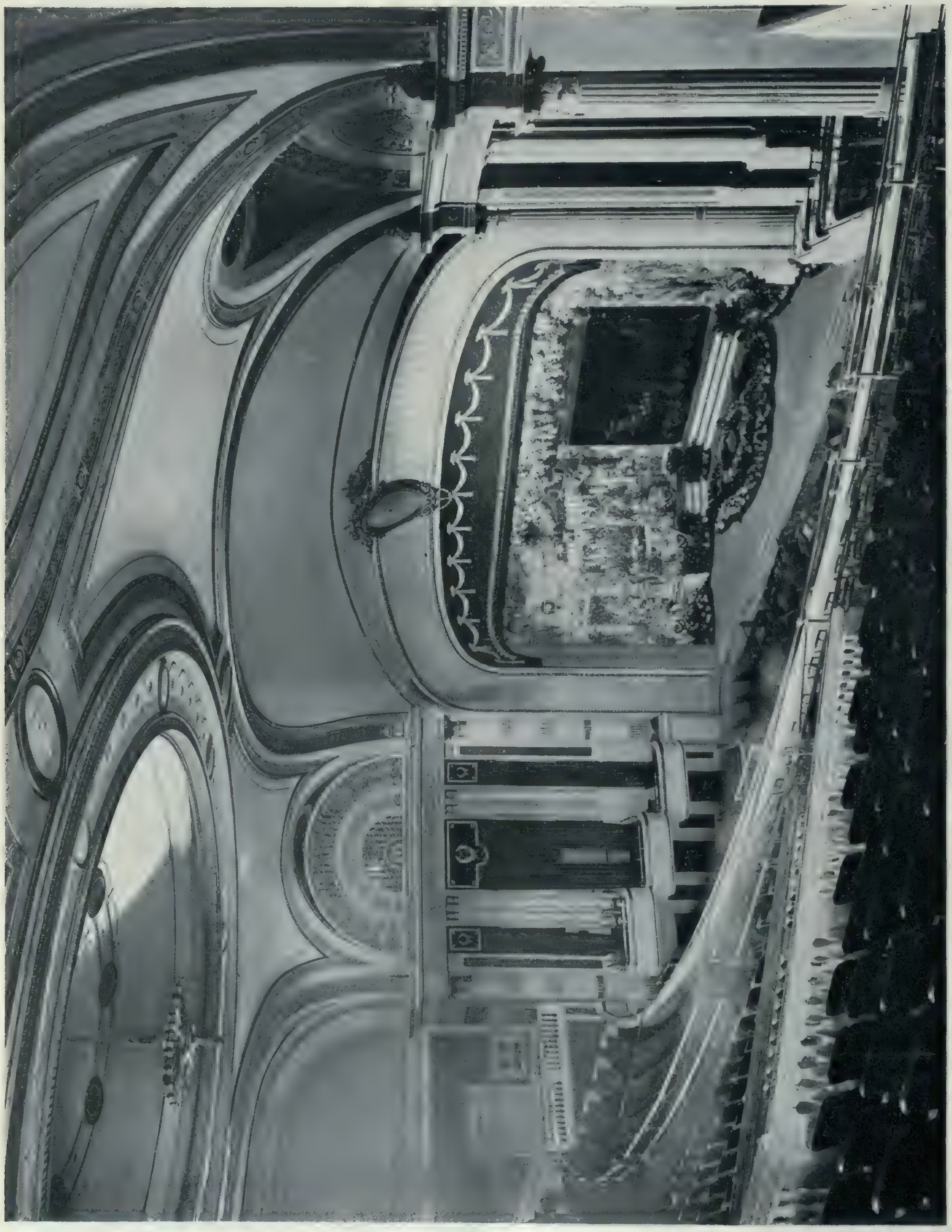
in turn opens into the inner lobby, both of which have been carefully designed in Italian renaissance style of architecture.

The inner lobby opens into the mezzanine promenade. This mezzanine floor is located between the orchestra and the balcony. It has an open well, 20 ft. wide by 40 ft. long, making it practically one floor from the orchestra to the vaulted ceiling of the mezzanine. Surrounding this open well is a broad promenade off of which opens retiring rooms for ladies and smoking rooms for men. Passages lead from this promenade to the lower part of the balcony, and stairways to the orchestra and to the upper part of the balcony.

The main body of the auditorium has a general color scheme of old rose, carried out by means of draperies, velvet wall coverings and carpets.



AUDITORIUM: NEW PANTAGES THEATRE, TORONTO.



VIEW OF AUDITORIUM.
LOEW'S UPTOWN THEATRE, TORONTO.
THOS. W. LAMB, ARCHITECT.

The auditorium is 120 ft. wide by 145 ft. deep, and seats three thousand persons. The furnishings of the house are in keeping with the general high standard set by the Loew enterprises and considerable thought has been given to making all parts of the theatre convenient and comfortable for its patrons

A beautiful Japanese setting has been installed on the stage, immediately in front of which is the musicians' pit for the large concert orchestra.

While the theatre is primarily intended for use as a motion picture house, it has also been equipped with a completely rigged stage for the purpose of vaudeville performances if desired. A dressing room section has been provided giving comfortable accommodations for both actors and musicians.

Both playhouses are of the usual type of theatre construction and fireproof in character, a structural feature of the Pantages being the concrete girder over the proscenium which is 13 ft. deep and 2 ft. 2 in. wide, and has a clear span of 51 ft., with a wall bearing at each end of 6 ft. 10 in.

PROMENADE: LOEW'S UPTOWN THEATRE, TORONTO.

How to Light a Movie Theatre

The old idea that a completely darkened room is required to show lantern slides clearly was disproved before the advent of the moving picture. It had been demonstrated that the only points to be watched were that the light from without should not fall directly on the screen itself nor shine into the spectators' eyes. Yet moving picture house managers have been slow to realize this. Some of their buildings are even now too dark for comfort. Since illuminating engineers have given much consideration to the topic, this is no longer necessary. Analyzing the problems involved, the "Electrical World" gives the following information:

"When lighting problems are considered, auditoriums of photoplay theatres present a condition differing somewhat from that presented by the legitimate theatre because sufficient light must be furnished to permit the audience of the photoplay theatre to find its way about, yet the distribution of this light must be such as not to interfere with the picture on the screen. The intensities in different parts of the theatre may be materially different, since the surface most vitally important is the screen. It is usually quite practicable to raise the illumination in the rear or at the entrance if the screen itself is properly submerged in darkness.

"In this way a person entering is not at first subjected to so low an intensity of illumination as he is after passing down toward the front of the theatre. The minute or two which elapses between the time of entering and the time of reaching an area of low illumination gives the eye time in which to accustom itself to the lower intensity.

"A second requirement of this type of light-

VIEW OF MEZZANINE: LOEW'S UPTOWN THEATRE, TORONTO.

ing is that the greatest amount of illumination should be thrown upon the horizontal plane; that is, the seats and aisles. It is considered poor practice to throw any amount of light on the side walls because of the effect of reflection toward the screen. Moreover, such light serves no useful purpose. The third point to be considered is the elimination of sources of light from the field of vision. In this category fall such items as bracket lamps along the side-walls or lamps on either side of the screen, if the units are low enough to catch the eye. Such lamps not only tend to disturb the eye, but they also produce depression of vision and cause a diversion which distracts attention from the picture.

"As an example of a method by which such lighting can be worked out, an illustration is shown of a lighting installation at Escanaba, Mich. . . . The lighting is effected solely by means of artificial windows in the ceiling. Above these windows are long boxes approximately 18 inches (45 cm.) in height, painted white inside. These boxes act as diffusers, throwing the light through the windows into the auditorium. The type of glass used gives very good diffusion and efficiency. The lamps are arranged on three separate circuits, allowing for the use of full intensity, a secondary intensity, or a very low intensity for photoplay work. The lamps on the circuit which give the lowest intensity have been so graded in size as to furnish a very low value of illumination near the front of the theatre and a higher value of illumination near the rear. This type of lighting directs the greater percentage of light where it is needed.

◆

The Suspicious Client

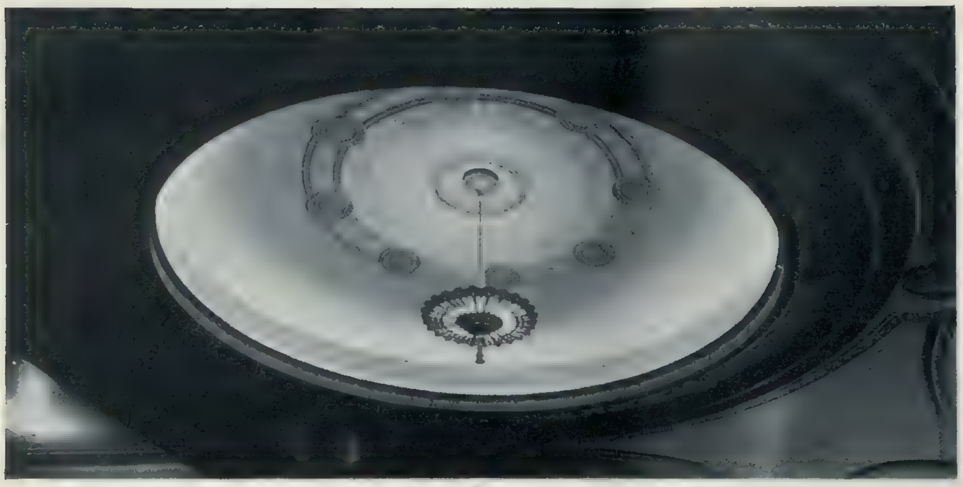
Man is born to trouble as the sparks fly upward and even architects cannot escape the ills of humanity, while we might add that of late years between the Scylla of war restrictions and the Charybdis of Government interference and labor difficulties they have had possibly an unfair share of trouble. So writes the "Architect" of London under this heading. But these or some of them we may hope to see removed—if we have the patience of Job—but there is one trouble that most of us have experienced more than once, which may be always with us, and this may be defined as the Suspicious Client. The Suspicious Client can be divided into many

MEZZANINE PROMENADE: LOEW'S UPTOWN THEATRE, TORONTO.

classes. First, we have what may be termed the lower grade of business man who, conscious of his own customs and methods of doing business, cannot conceive of the average architect's standpoint. Such a man argues that because an architect controls the expenditure of considerable sums of money some of it must stick to his fingers. He would in truth more often than not condemn an architect for stupidity if he understood that nothing of the kind took place. We have known a member of an important public body who explained at a meeting of that body that it was necessary to go through an architect's specification in order as far as possible to eliminate his opportunity of taking secret illicit commissions as he said it was well known that this was a general practice in the profession. The architect in question being present remarked that the public body were unwise if they employed any man whose honor they had reason to suspect, and privately warned the speaker that a repetition of his remarks would be met by a demand for a written apology; but the remark was made in perfect good faith, and without the least intention of offending, and we believe the speaker afterwards thought that the architect was very thin-skinned to have objected to such an imputation. It was well known to the town we are speaking of that many years ago there was an architect, wholly unqualified and a member of no professional body, who never gave a certificate to a builder without receiving a check for his condescension first.

But these incidents happened in the bad old days, which we hope are now past and at a distance from the sacred shrine at No. 9 Conduit Street.

Another variety of the Suspicious Client is more frequently met with nearer the haunts of civilization, and may be defined as the man who makes up his mind that the architect is anxious to induce him to spend more money and to incur extras. Of such a type was a well-known provincial solicitor who built himself offices. He told his friends that when his architect came to him, as he did on several occasions, with suggestions that would improve the design, he asked him whether they would increase the cost, for if so he did not wish to hear of or discuss them. The architect filled the highly colored role of the tempter, and was at once suspected, and the solicitor advised all his friends who



DETAIL OF CEILING LIGHT.

had to deal with the dangerous and uncertain race to follow his example.

A third variety of the Suspicious Client is the man who quickly begins to believe that architect and builder are plotting against him, and who covertly calls in other advice to see if he cannot trip up the malefactors. Such a man will never believe that he is receiving his money's worth, and spreads a doleful story of the architect's secret machinations. He has one consolation: it is true that the world must seem to him a very interesting place, beset as it is with lurid drama, but in the process he is a little trying to the architect who endeavors to do his best.

Yet another variety of the Suspicious Client has the overmastering conviction that the architect only cares about appearances, and is ready to sacrifice all material comfort and convenience in order to carry out his artistic ideas, and such men often obtain considerable help and assistance from their wives in making out a true bill against the architect who always fails in making every room a nest of cupboards. That unhappy man may be partially consoled by the knowledge that his client does not suspect him of actual fraud, but only of criminal negligence, which is partially explained by his ignorance, but he may, nevertheless, be a terror to deal with.

The man who builds and who cannot from drawings realize fully what he is going to obtain may frequently become in the end a Suspious Client, and his suspicion may develop on any of the lines we have described, for this reason it is always well to be extremely careful in the case of the client who is disposed to leave everything to his architect's better judgment. The client may say at the beginning that he will leave everything to the architect, but the latter is wise if he does not assume that for that reason the client has forgone the Englishman's love of grumbling. An appearance of settled, fair weather at the commencement of a job is, in fact, more frequently than not the precursor of a stormy finish, for the client would be the last to admit that his architect had any justification for not giving him exactly what he imagines he wanted all along. The architect is, therefore, prudent if he tries to force his client to understand at the beginning, and should refuse to take the *carte blanche*, which experience should teach him is never meant. Similarly the client who affects a sort of offhand indifference to questions of cost at the beginning often quibbles about the smallest item in the end.

Our picture of the architect's bugbear—the Suspicious Client—should make the rest of mankind feel how necessary it is to comfort and sustain the architect amidst his trials. To do this it is only necessary for the Ideal Client to come forward in large and in-

AUDITORIUM: LOEW'S UPTOWN THEATRE, TORONTO.

creasing numbers, to remove all restrictions, and to increase the architect's rate of pay, and in short to make the practice of architecture, as it should undoubtedly be, the happiest, noblest, and most lucrative calling the world. If this is done the occasional Suspicious Client whom we are compelled to meet and deal with will not bring us in sorrow to an early grave, though his efforts may induce the coming of silvery patches among our once raven-colored locks.

◆

How the Egyptians Built the Pyramids

Much of mystery has always overhung the Great Pyramid—a structure so stupendous that the building of it in a primitive age, when no machinery was available, must, it is often asserted, have been accomplished by the use of mechanical powers now unknown.

The Pyramid of Cheops—the only one that remains of the famous seven wonders of the world—is the largest work of man's hands on the globe. Originally 181 feet high, it covers almost 14 acres and contains 85,000,000 cubic feet of solid masonry.

But the mystery in relation to it has been swept away by recent scientific inquiry. In these days, helped by modern machinery, one-tenth as many men as Cheops employed could duplicate the structure in less than half the number of years, observes the Kansas City "Star."

The Great Pyramid is on the west bank of the Nile, across the river from Cairo. Ten miles farther up stream, near the east bank, are the quarries of Turra, which yield to this day a fine white limestone highly suitable for building purposes. It was from these quarries that the blocks for the pyramid were cut, to be thereupon loaded on rafts and floated down the river.

Lacking better means, the quarrymen got out the blocks by cutting deep grooves in the rock, inserting big wooden pegs at short intervals and pouring water upon the pegs, the swelling of which split the limestone neatly. The hardest rocks may be dealt with effectively by this means; with limestone it was easy.

The blocks weighed from ten to twenty tons apiece. On each of them projections or "legs" were left for the attachment of ropes. Man power was depended upon for hauling the big pieces of cut stone overland and the first thing necessary was to load the block upon a sled with the help of rollers. Then it could be dragged along by hundreds of toilers who manned the ropes, while "boosted" from behind by levers.

DETAIL OF BOXES: LOEW'S UPTOWN THEATRE, TORONTO.

Transported in this manner to the river bank, the stone block was pulled and pushed upon a raft which floated it down the river ten miles to the place of debarkation. There it was hauled off the raft, loaded again upon a sled and conveyed, in the same way as before, to the site of the pyramid.

It is believed likely the work of cutting and shaping the blocks was carried on while they were actually in transit by the workmen, who, perched upon them, could use their tools to excellent advantage, pecking with stone hammers, chopping with chisels of fire-hardened bronze, and giving a final polish with smooth stones and sand. It is estimated about thirty years were required to build the Great Pyramid and that 100,000 men may have been employed.

Battlefield Memorials

By Percy E. Nobbs, M.A., F.R.I.B.A., R.C.A.

An address delivered at the recent R.A.I.C. Assembly, Ottawa, incorporating evidence given before the Special Government Committee on Battlefield Memorials.

I PROPOSE to confine my remarks to the very practical question of the probable competitions in the near future, rather than to expatiate upon what I think and feel in regard to the various battlefield sites.

As you are all aware, a Commission was appointed in regard to this matter. You probably also know that a very substantial preliminary sum has been voted for the purpose of competitions, preparing the sites, etc. I have not met the Commission since it was appointed, and my relations with it have been purely honorary; that is to say, General Mewburn asked me to meet him and his associates in this matter and give some advice previous to the appointment of the Committee. Of course, I was very happy to do that. In so far as I found myself singled out to represent the views of the profession in this connection, I am now here to render an account of my stewardship in taking care of your interests, and to answer any questions you may ask as to why I recommended any particular thing.

The Commission has taken no action since it was appointed. The Minister of Militia, who is a member of the Commission, is abroad at present, looking over the sites among other things, and when he comes back some definite action will, I suppose, be taken.

I may or may not be associated with the Commission in the carrying out of the project, but so far as I know at the present moment, things will be carried out along the lines I have advised.

Perhaps the easiest and clearest way of placing the situation before you would be for me to read to you the evidence I gave before the Special Committee of the House last June.

The situation arrived at was this—the sites had been obtained on the various battlefields. The owner of Bourlon Wood presented a corner of the wood to Canada on which to erect a monument in connection with the Cambrai affair. Some other sites were bought. The sites of the proposed monuments are: St. Julien; Passchendaele, Crest Farm; Hill 62, Observatory Ridge; Hill 145, Vimy; Dury Cross Roads; Bourlon Wood; Courcelette, and Hospital Wood. Those sites have been obtained, and at the meeting at which I gave evidence there was some discussion as to whether we should erect seven monuments and one specially large one, or eight monuments of equal importance upon the eight sites selected. This is a question which will probably be decided at an early date. Sir Arthur Currie gave his views on the subject, and I fancy the Minister of Militia will have a pretty clear idea of what to recommend, that is, whether it is better to have eight monuments of a kind, or seven smaller monuments and a large central one.

My evidence was as follows:

Mr. Nobbs—The last time I was here we discussed the advisability of one large monument and seven battlefield monuments. Of course it is for the Committee to decide whether they want one large and seven smaller monuments, or eight similar monuments, but I think really eight monuments should be erected in all. I have advised already that designs for the monuments should be obtained by means of a public competition. There would be no difficulty in naming eight separate competent architects in Canada, but as this is a public matter, there is a great deal to be said in favor of a public competition for selecting the designers to be honored with those commissions. The machinery for one large and seven smaller monuments would be very much the same. If a competition is to be started it is necessary to have professional architects appointed to judge the designs. It is absolutely necessary also for the Government in this competition to put itself right with the architects, and the essential thing which the profession requires is to see that the matter is decided upon the professional assessors' award, and a second thing is to see that the conditions of the competition are actually carried out.

There must be a distinct understanding in the competition, which must be a contract between the promoters —the Government—and the various architects—the persons to be entrusted with the carrying out of the work. That is a matter of technique that the professional assessors will have to carry out. I do not think it is necessary to go into details at this particular time.

When we come to consider, however, what the rewards are to be, that is a matter for the Committee to decide. Now, consider how many architects there are in Canada, and how desirable it is that every one of them should respond, as they will if the conditions are satisfactory. Probably this competition should be handled in two stages, the first as an open competition for the selection of a limited number of architects who would be asked to submit further designs and be remunerated for doing so in the second competition. I advise that in the first open competition the conditions should be as general as possible, merely indicating the number of cubic feet, or the number of dollars of expenditure, with some idea of how much stone the sum would buy, so as to give designers the utmost scope for making suggestions.

Of course, there will have to be assessors, probably three in number, to select perhaps fifteen architects for the second competition. The preliminary designs should not be of a very expensive nature. Then, when we have the fifteen architects, we can call them together and ask them for suggestions. By the time the professional assessors have looked over the suggestions they should be prepared to recommend the best type of monument. I do not think the question of type matters very much at the present time. The decision whether we should have obelisks or triumphal arches or pyramids is a matter that will result from the competition. Of course, the obelisk type would give you greater height, the pyramids most mass, and so on; but this really does not make much difference at the present time when the first open competition is before us.

There is certainly a great deal to be said, however, for the final monuments conforming more or less to one type. There will be so many monuments in France that it is important to have a distinctive Canadian type and a series of monuments should be erected which will leave a certain impression upon the visitors of what the Canadian monuments look like. On the other hand, in order to get all those monuments really interesting in character they should be distinctive in matters of detail, that is to say, they should be the work of different designers.

There should be as many architects commissioned as you have monuments, and they should be selected by an open competition followed by a limited one.

Mr. Peck—Would you have them all exactly alike?

Mr. Nobbs—No, but a general ruling type should govern all those monuments, and possibly when you have actually selected your eight architects these gentlemen might meet together and decide among themselves upon certain governing characteristics. That is the advice I would give to this Committee in having the conditions of competition framed. There are a number of technical points connected with bringing this about, but I do not think it would be necessary to go into them now. For preliminary purposes the Committee should set a figure at a round sum, say, $100,000, for each of the monuments.

The Chairman (interposing)—Pardon me, but would we be safe in setting a round sum at the present time as to what the cost of erecting these monuments will be?

Mr. Nobbs—There is very little to go on. I suppose you know building in France costs about half what it does in Canada at the present time. Here it is a little more than twice the cost that it was in 1914.

The competition is to establish a type. You must not consider that the competition is to absolutely fix the design of these monuments, rather you should regard the competition as serving two purposes, first, to find the designers, and secondly, to establish the type, and after that the final details of the design will have to be worked out with the organization, Commission Committee, or whatever you have in the way of machinery to work with.

There is one thing which should be done as a precaution in the last stage of the competition, if it is running in two stages. There should be some provision for the French authorities to have a final review of the designs, and my advice would be to have one Canadian assessor and one French, and one English architect associated with him, to review those final designs.

Mr. Mowat—Is it your idea that the assessors should be architects?

Mr. Nobbs—Necessarily.

Mr. Mowat—Then you must exclude them from the competition?

Mr. Nobbs—That is the trouble.

Mr. Mowat—How will you get around that?

Mr. Nobbs—Every architect does not need to compete. Some of them may act as assessors.

Mr. Mowat—It will be hard to keep them out.

Mr. Nobbs—If there are two or three other War Memorials going on, I think there would be no difficulty about it. If, for instance, there is to be a National Memorial here in Ottawa, I do not think it will work any hardship on some architects to act as assessors.

Mr. Mowat—And your advice is to get two architects from other countries, and one Canadian?

Mr. Nobbs—Yes. It is very important to have a French architect. The French are a very critical people, and they should have a say in the final selection. In France there are, I believe, no War Monuments erected by private subscription until passed upon by an official architect. The French are a very critical people, and it is just as well to forestall public opinion by taking a French architect into consultation.

As to price I would suggest for the preliminary competition that you take $100,000 or $150,000 each as a preliminary figure, and multiply by eight, and you will see where you are.

Mr. Peck—You think $100,000 for each of seven monuments, and $500,000 for the greater central monument. Would that include ground?

The Chairman—We can eliminate ground, because we have that.

Brig.-Gen. Hughes—We must not forget there is landscape gardening to be done on those sites as well.

The Chairman—Could we ask seven at $100,000 each, and one at $500,000?

Mr. Peck—That is only approximate.

Mr. Nobbs—Yes. If you have a large monument and seven minor monuments, you would have two competitions, both of which should be carried out in this double barrelled way. I think that is the right way to obtain results.

The Chairman—What is your idea regarding General Currie's view about eight distinct memorials?

Mr. Nobbs—I think something very good can be got out of it. Something can be expressed by having a monument on each battlefield which you could never express by one single central monument.

It is a fact that the Canadians were fighting up and down the line—that is the historical fact—and I think if you made a series of these necessarily minor monuments it would have just as great an effect as one enormous monument. It would be a different kind of effect, but I think it would be just as great and just as strong, provided we had the designs distinctive enough in type and distributed over these three hundred miles of battlefield.

The Chairman—Would you concur in General Currie's view regarding that?

Mr. Nobbs—Regarding the desirability of eight monuments?

The Chairman—Yes.

Mr. Nobbs—I would say that I would like the eight. The view that a central one was not necessary was new to me. I had not heard the General express his opinion before. I would rather see the eight all along the line than a single one. One big monument is very tempting from an architect's point of view, but take the spirit in which the people are going to visit the battlefields. They are not going to stay in one place, they are going to travel up and down, and when they go from place to place, and see all these characteristic monuments, and perhaps see one from another on a clear day, I think they will get an idea of the scale of the Canadian effort, a much more general idea than they would if there were only one big central monument.

There is one point about materials which I think very important. One of the Committee spoke of where we will be in one hundred or five hundred years. I think it is most important to keep away from bronze. Let the sculpture be of stone, and use granite as much as possible. Take the old Greek buildings, for instance, all of the bronze and metal has been taken away. The walls of the Parthenon have been robbed of the bronze dowels, as have many of the other Greek buildings. You cannot leave metal lying about where a war may happen. I recommend the use of granite wherever possible.

(*There will certainly be war over that area again. It has been happening for the last two thousand years, and it is going to happen again. Let us leave some monuments by all means, but do not leave any metal lying about.*)

Mr. Peck—I raised the question at the last meeting, and I am very pleased to see General Currie is thinking along the same line. I think it is absolutely sound to have eight separate monuments all of equal distinction. That to me is the proper spirit. I think it will be better policy and less liable to cause a division of view for reasons that we all understand.

Mr. Power—For the purpose of discussion, you say you think $100,000 or $150,000 would cover the cost of each monument. Is it your intention to have the sculptors and architects submit a preliminary sketch, or something of that kind, which would give something upon which we could work, and then we could select a certain type from that? Surely you do not mean anything final about this $100,000.

(*Of course I do not know how much money they are prepared to spend, but I think if they put a couple of million dollars into the whole thing they would be doing very well. Don't you think so, Mr. President?*

The President—That is what struck me when I thought it over.)

Mr. Nobbs (continuing reading)—My idea is for a preliminary competition in order to prevent wild and extravagant ideas being promulgated, and when we restrict it to a matter of, say, $100,000, which will put up twice as much stone or solid material in France as it will in Canada, we will be eliminating, perhaps, some very wild, extravagant schemes which might otherwise be submitted. Under a restrictive condition of this kind there is less danger of some architects running riot.

The Chairman—Would you give this Committee an approximate idea of what we should recommend as to the amount of money that should be appropriated in connection with this? These monuments will take some time to build, but we ought to have enough to go on with the roadways and competition prizes and so on, and then come down to the memorials a little later on; but, let us get something that we can present to this session of Parliament for some definite action.

Mr. Nobbs—If you are going to hold a competition the cost of the competition will comprise the payment of the assessors and the premiums for the architects competing in the second round of the competition.

The Chairman—Could you give me an estimate of what you would consider Parliament would vote as an adequate remuneration for designers and so forth in the second round? The first round I understand they do not get paid for.

Mr. Nobbs—No. In the first round they do not get paid, and the drawings should not be of an elaborate nature. If eight designs are then needed in the second round of the competition I should say an adequate reward would be anywhere from $200 to $500 each, to cover their expense getting out drawings, or possibly making models for say sixteen selected competitors.

The Chairman—You say $500. That would be $4,000 for that.

Mr. Nobbs—No. For eight monuments I would invite from sixteen to twenty. If you invite twenty architects for the final round, and give them $500 each, there is no reason why they should not submit plaster models instead of drawings.

The Chairman—We should recommend some approximate sum for this purpose.

Mr. McCurdy—Let us total this up. You say there is $10,000 to start with.

Mr. Nobbs—Yes. $10,000 of premiums. That is in order to acquire plaster models and give the architects who are making the designs a chance to study their work carefully.

Mr. Peck—You are not going to confine it exclusively to architects?

Mr. Nobbs—No, architects, sculptors, and designers, but others than architects would have to associate themselves with architects in carrying the thing out.

The Chairman—We will start then with competition for designs, $10,000?

Mr. Nobbs—Yes.

The Chairman—And for roadways, $150,000?

Mr. Nobbs—Your assessors will cost you something. You will have to compensate these assessors, and as they may be chosen from the very men who would be likely winners of the competition, we will have to consider their professional time. In an ordinary competition you find an architect will get five per cent., and in such cases five per cent. of five per cent. is adequate assessors' remuneration. In this case we are not arriving at one decision. It is much more difficult to make eight awards. Allow between $3,000 and $5,000 for your assessors, depending upon the various conditions which may arise. I think you will be safe in using that figure.

Mr. Chairman—Of course the rules of the competition would have to be distributed, and we wanted to get a rough idea as to an amount to submit to the House now.

Colonel Osborne—Then there are travelling expenses to be considered.

Mr. Nobbs—Yes. It all depends on where you get your assessors from. Put that down as an item, then allow another item of contingencies of, say, 10 or 15 per cent. of the whole.

Mr. McCurdy—You advise one Canadian, one French, and one British assessor?

Mr. Nobbs—It is especially desirable in the second competition. I do not know whether these gentlemen should be brought in at the present stage of the competition, or whether their advice should be asked after the designs are actually accepted. It depends on who they are to be. You know they always speak in guineas on the other side, and you might put down another item of a couple of hundred guineas each.

Mr. McCurdy—That brings it just a little below the standard. A guinea is not worth a pound in our money.

Mr. Nobbs—You might add 200 to 300 guineas for fees to outside assessors. As I said before it is essential that you should have a French architect in the final stage.

Mr. Mowat—Did we eventually come to the conclusion that we were to have all Canadians?

The Chairman—We have not decided on anything yet.

Mr. Nobbs—It is very desirable to leave the final competition alone for the present. There are other things to occupy your time at this stage. You might get some very brilliant ideas from an unexpected source. Supposing you get twenty Canadian architects out of the first competition, it would seem to me very desirable to canvass their opinions about the whole thing before going on to the second.

(*That was really the essential point I was driving at. To get the first open competition in a very fluid condition, and keep it that way, for the selection of the twenty architects for the final, and practically make those twenty competitors draw up their own conditions, particularly as to regulations, and see what conclusion they arrive at. Personally I would like to see them arrive at a decision among themselves.*

I think it would be quite possible in a case of this kind to have the competitors make a decision among themselves. There are two or three ways in which their voting could be arranged. I am quite convinced from my experience that the competitors know more about the problem than does the assessor. They must necessarily know more *about it, because they have had a closer study of the problem.*

Now, can a competitor be sufficiently open-minded to see any good in any other design? I think he can. I think if you arrange a system whereby you would give each competitor three votes for the design he thinks best, saying to him, "Of course, we expect you to cast those three votes for your own design, but you have two other votes for the design you think next best, and one vote for the design you think third best. Now, go ahead and vote." I believe a satisfactory result would be arrived at.

There were some further discussions before the Committee on the question of cost, after which I said:)

Mr. Nobbs—I feel very strongly this should be restricted to Canadian architects and to Canadian designers.

Mr. McCurdy—All residents of Canada, or Canadian born?

Mr. Nobbs—Canadian architects and sculptors. I think the true test should be, does the man work in Canada. It should be for those men who are working, making their living in Canada. It has been mighty hard times for the architects during the last six years. It was all right for the younger men in the service, but for the older men it has been a pretty hard time.

Mr. Peck—I am ready to put a provision in that this be confined to Canadian designers.

Mr. Chairman—Mr. Nobbs, are there any other suggestions you can give us?

Mr. Nobbs—No, sir. If the Committee will decide definitely as to whether they want seven or eight of a kind —if that point is decided it will simply be a matter of redrafting the conditions accordingly.

The Chairman—The conditions were drafted on the assumption that we would have the seven and one larger.

It is recommended then that a sum of not less than $250,000 be immediately voted to carry out the immediate construction of roadways, the cost of competitions, designs, and preliminary expenses. If we have $250,000 right away we will not need the balance before the next session of Parliament.

I was then asked how long it would take to put the competition through, and I said if I were retained as professional adviser, and if they could get busy right away and have the assessors selected, the business could be proceeded with during the winter. There has been delay in the matter. The appointment of the Commission only went through the other day, so the whole thing is a little behind.

I fully expect the first stage of the competition will be dealt with at Christmas time. As to whether I shall have anything to do with it, I do not know.

As to other possible assessors, the probability is that the President of the Royal Institute of British Architects will be asked to appoint one, and the President of the Societie des Architectes Diplomes in Paris will be asked to appoint another. There is a possibility that the English appointment will be Professor Reilly of the School of Liverpool, and that the French appointment will be a very distinguished French Professor of Architecture in Philadelphia, Paul Cree, but nothing definite has been done.

I fully expect, although I have no authority whatever to speak definitely in the matter that the conditions of the competition will be printed and published within a few weeks, and that the preliminary competition will be disposed of by Christmas.

If I have failed to make myself clear on any point, I would like you to draw it to my attention, and if there is any further information you care to have, I shall be only too pleased to give it to you.

Since the Commission has been appointed I have had no dealings with them. All I can do is to tell you how I advised them before appointment.

The President—This morning I think I made the statement that the conditions surrounding those proposed competitions were very hopeful indeed, and I think after the full description just given by Professor Nobbs you will agree with me that things are very promising.

Mr. Nobbs—There are two other points in connection with competitions in regard to which I would like to say a word. There are two other competitions on the horizon, which are much more serious as far as the financial point of view and the size are concerned, although certainly no more important from the strictly emotional point of view.

Firstly, there is the question of the Canadian National Memorial at Ottawa. A meeting was held in May composed of representatives of the various learned societies. I was present at that meeting in virtue of my membership in the Town Planning Institute. Professor Currelly, Director of the Toronto Museum, and Dr. Doughty, of the Archives, were present representing the Royal Society. Mr. Millson and I represented the Town Planning Institute. Mr. George Reid and Mr. Homer Watson represented the Royal Canadian Academy, and Mr. Meredith and Mr. Cromarty represented the Royal Architectural Institute of Canada. We met at the Archives Building and discussed the situation with regard to a National Memorial, and the relation of such a memorial to the question of housing war trophies.

As you know Canada is possessed of a wealth of war trophies as a result of the successful termination of hostilities. Now, modern guns, for instance, will not last in the open air.

The meeting was a very interesting one, and while no one had any definite idea of the subject when the meeting was called, and no one had any intention of getting the whole meeting to look at the matter from his point of view, after a few hours of very interesting discussion under the able chairmanship of Dr. Currelly, we arrived at a unanimous decision, and that was that in our view the Canadian National Memorial should be at the same time a Museum. I forgot the exact phraseology of the decision, but that was the effect of it.

Mr. Cromarty kindly consented to act as Secretary, and we went over and saw Sir George Foster, and Sir Henry Drayton. We had dinner in the evening with Mr. Rowell. I understand Mr. Cromarty sent an unofficial communication, but I do not think anything definite has been done. Professor Currelly has been away in Europe, and no doubt upon his return the question will be reopened.

Secondly, there is another competition in view in connection with a very large and ambitious scheme indeed, that is the City Hall at St. John. They had a beautiful old Court House at St. John, a perfectly splendid old piece of architecture, which made St. John at least fifty per cent. more attractive than it otherwise would be. This beautiful old building was burned out recently. The present proposition is to forget about the old building, and construct a new one. After all, a city must be trusted to look after its own affairs. At the same time, it is a pity historically that this beautiful old building should be sacrificed. After looking the situation over, I am afraid it is going to be sacrificed. I sent the authorities of St. John some copies of standard conditions of competition for their guidance in this connection, and this is what appears in the papers:

> "A call for competitive plans for a new Court House and Municipal Building to replace the ruins now standing at the head of King's Square was approved at a meeting of the Building Committee of the Municipal Council held yesterday afternoon in the County Rooms, Prince William Street, with Commissioner Thornton presiding. As an incentive a cash prize of $150 will be offered for the most satisfactory set of working plans. The competition will not be limited to local aspirants. . . . .
>
> "The motion to advertise for competitive plans for the new Municipal structure was made by Mayor Schofield, and after long discussion it was adopted. The plans are to follow a form which will be prepared by Commissioner Thornton and a technical adviser on the lines submitted at a previous meeting of the City Council by the Engineering Institute of Canada and a firm of Montreal architects."

Now why should the Engineering Institute have anything to do with a job which is obviously our affair? They should, I think, have handed it over to us.

The President—They should have done so.

Mr. Nobbs—They probably did not because there were a few dollars in it. The Engineering Institute appear to have dealt with the whole thing without any reference to any architect whatever. If the professions are going to treat each other in that way for the sake of a few dollars commission, it is a most deplorable condition. The report continues:

"The Central building of the Court House and associated offices will be used as a working base, but the whole plan will take in the development of the block, and a premium of $150 will be given to the person or persons submitting the best working plan. Several bids were received for the boiler which has been used in the old Court House. . . . ." and so on.

I wish to apprise you all of the fact that a very interesting problem is there for solution. There will be a big competition resulting out of it, though the conditions of competition, as far as they have been reported, do not seem eminently satisfactory. I think this is a case where the President of this Institute should certainly offer his services with as little delay as possible.

The President—I am very glad Professor Nobbs has brought up this subject, because at the Council meeting at which our next President is appointed we can arrange to have him deal with it.

I presume you all know I have been in touch with Sir George E. Foster in regard to the Beaverbrook scheme.

Mr. Nobbs—No, I did not know about it.

The President—I have a letter from Sir George, under date July 8th, in which he says:

> "In answer to your letter of July 2nd I do not know that there is any definite information which can be given with reference to the proposed Dominion War Memorial. The article in the 'Gazette' was probably based on the report that Lord Beaverbrook, who has collected a number of paintings, proposed the erection of a building for them in Ottawa, and had gone as far as to have plans prepared. These designs, however, have not been accepted by the Government, and I am not now in a position to say what will be done with reference to Lord Beaverbrook's plan. Different societies and associations appointed delegates to interview the Government with reference to the state of the whole question, and asked for a Commission for that purpose. The Government has taken no action with reference thereto, but I will endeavor as soon as possible to discuss the matter with my colleagues."

Mr. Nobbs—Is it the intention to have these competition matters discussed by the present Council or will they be taken up by the new Council?

The President—I should think the new Council would deal with it. The new Council will be appointed to-morrow morning, and can take up the question as soon as practicable.

◆

Take Care of its Trees

The Hydro-Electric Commission and the Parks Department of the City of St. Thomas have placed the trimming of the trees on the streets where hydro wires are strung under the superintendency of the Horticultural Society. The St. Thomas Horticultural Society have as their chief plantsman, Mr. R. V. Smith, formerly superintendent of Parks of London, who is an expert along this line. The trimming is being done in a sane manner. That part of the work on the tree that it is necessary to remove to protect the wires is paid for by the Hydro Commission, and the balance of the work to make the tree symmetrical is paid for by the City Council. The spirit exhibited by these two municipal bodies is commendable.

R. A. I. C. Council Proceedings

THE following items of business were taken up for consideration by the R.A.I.C. Council at the recent Ottawa General Annual Assembly. Two meetings were held, one on each of the two days of the assembly, with the following members of the Executive in attendance: Messrs. A. Frank Wickson (chairman), W. D. Cromarty, John M. Watt, Chas. S. Cobb, H. E. Moore, David R. Brown, and Alcide Chausse (secretary).

At the first session the minutes of the Council meeting held at Montreal, July 10th, were read and approved. Mr. Chas. S. Cobb reported progress in reference to the R.A.I.C. Medal, and Mr. A. Frank Wickson as regards negotiations in reference to remission of R.I.B.A. dues.

Saskatchewan Association of Architects—Mr. Wickson stated that he was in communication with the Saskatchewan Association of Architects with respect to past dues. It was decided that an effort be made to have this matter arranged as soon as possible by the incoming Council of the Institute.

Battlefield Memorials—The Hon. Secretary reported that as decided at the last meeting of the Council, he wrote to the Clerk of the House of Commons requesting two copies of the "Report of the Special Committee on Battlefield Memorials," but received instead "Votes and Proceedings of the House of Commons, No. 47, Ottawa, May 6th, 1920." While attention was drawn to this error, the information asked for has not as yet been received.

R.I.B.A. Committee on Unification and Registration—The Secretary further reported that Mr. Andrew T. Taylor (retired F.R.I.B.A.) has acknowledged the confirmation of his appointment to represent the architects of Canada on the R.I.B.A. Committee on Unification and Registration, and that the first report of the proceedings of that committee has been received.

Duty on Plans—Mr. Cobb explained the recent increase in duty on imported plans, due to representations made to the Government, and the effort which is now being made to have an impost placed on specifications as well.

Rome Scholarship Competitions—A letter from Mr. Evelyn Shaw, Hon. Secretary of the British School of Rome, was read as follows: "With reference to your letter of July 21st, I am desirous of making one point clear on which apparently some misunderstanding has arisen. The Rome Scholarship in Architecture, like other Rome scholarships, is an open scholarship and any student may compete who complies with the conditions as to age and nationality. The Jarvis Studentship in Architecture is limited to students and associates of the Royal Institute of British Architects and is awarded at the discretion of the Faculty of Architecture of the British School at Rome to the student or associate of the R.I.B.A. who in the competition for the Rome scholarship is placed next in order of merit to the winner of that scholarship. It will, therefore, be clear that the two awards are made on the result of the same competition. I am requested to express regret that it is not possible to propose any alteration in the plan of holding the final competition in London, but the Faculty of Architecture will be asked to consider whether students and others of the allied societies of the R.I.B.A. can become eligible for the Jarvis Scholarship."

Canadian Engineering Standards Association—The Canadian Engineering Standards Association acknowledge by letter the receipt of correspondence from the Institute stating that the remarks contained therein would be placed before their committee at its next meeting. The letter assures the Institute that the fullest possible consultation was being carried on both with the Canadian Fire Underwriters' Association and the Canadian Manufacturers' Association, regarding the question of a Canadian National Electrical Code.

Association of Canadian Building and Construction Industries—A letter from the Association of Canadian Building and Construction Industries was received acknowledging information regarding the appointment of Messrs. Joseph Perrault and John M. Watt as representatives of the Institute to co-operate in the drawing up of a standard form of contract, and thanking the Institute for its prompt action. The chairman of the committee, Mr. H. T. Hazelton of Winnipeg, the letter states, has been notified as to the names of the representatives chosen.

Provincial Technical Associations—The secretary reported several replies to the letter sent out in reference to the formation of provincial technical societies along lines suggested at the previous meeting of the Council in a communication received from the British Columbia Technical Association. The British Columbia Architectural Institute being instrumental in forming the B.C.T.A., and a large number of its members belonging to the latter organization, *ipso facto*, endorses the idea. The Saskatchewan Association favored the formation of some such body as would eventually merge into a Dominion-wide organization. The Alberta Association felt that owing to their limited membership a more adequate degree of protection might result in uniting with kindred professions in their province, expressing at the same time the view that care should be exercised so that such an amalgamation would not obscure or interfere with the identity of the architectural fraternity as a distinct organization. The Manitoba Association reported that inasmuch as the B.C.T.A. was made up mainly of members of the engineering profession, it did not consider that the Manitoba architects should take the initiative in a movement of the kind.

Other replies were received from the Quebec and Ontario Associations, stating that the matter would be given consideration by their respective councils.

It was resolved that the president appoint a member of the R.A.I.C. Council for each of the federated associations with the object of forming a committee to consider the question and report at the 1921 General Annual Assembly.

Nova Scotia Association of Architects—The following letter was also received from President R. A. Johnson of the Nova Scotia Association of Architects, in reference to the effort which is being made to secure registration in that province: "At the last session of the Provincial Legislature an attempt was made to obtain the passage of an Act similar to that in force in Saskatchewan, but it met with such determined opposition that we were unable to obtain anything. All architects in the province with one or two exceptions, are strongly in favor of registration and license to practice, but the politicians were too much for us. It is hoped at the next session of the Legislature to obtain an Act incorporating the Nova Scotia Association of Architects, but it will be impossible under present conditions to obtain any restrictive legislation."

It was decided by the Council to negotiate with the above organization with a view to inducing it to federate with the R.A.I.C., and to give full moral support to that body in the effort which is being put forth to secure registration.

Campaign of Publicity—Replies indicating the attitude of the following provincial associations on the question of a Dominion-wide publicity campaign were received in response to a communication on this subject recently sent out by the Council. The Manitoba Association of Architects who brought this matter to the attention of the R.A.I.C. favored such a campaign. The Architectural Institute of British Columbia is likewise unanimous that a form of systematic publicity would prove desirable. The Saskatchewan Association of Architects, while working at the present time on a scheme to be put in operation in that province about the first of the year along lines similar to those adopted in Ontario, are willing, if the other provinces wish to unite in a national campaign, to co-operate as far as their finances will permit.

Architects' Fees—The question of revising the schedule of professional charges was considered, it being pointed out in this connection that the Ontario Association of Architects had already adopted a new scale of fees. Attention was also drawn to the following schedule of charges recently adopted by the recently formed "Federation des Societies Francaises D'Architectes":

For the first 50,000 francs	7 %
For the following 50,000 francs	6 %
For the following 400,000 francs	5½%
For the following 500,000 francs	5 %

There is also a special table showing charges to be made for various services that an architect is called upon to render.

It was resolved that this matter be further considered by the Council at its next meeting.

Action Against Dominion Government—Another matter before the Council was the pending litigation involving the rights of Messrs. Saxe & Archibald, Montreal, and others, in reference to the Ottawa Government Buildings Competition. The R.I.B.A. has decided to engage counsel to follow the case as a measure of assistance to the contestants, but does not desire to incur any unlimited liability, preferring if possible to make some arrangement whereby counsel would undertake the case for an inclusive maximum fee of one hundred guineas. The R.I.B.A. Council is of the opinion that their participation in this connection should be of benefit to the competitors, and that the moral effect would be still further increased, if similar action were taken by the P.Q.A.A. and other bodies whose members were directly interested.

Communications bearing on the case were received from Messrs. L. H. Jordon and A. Melville, of the Manitoba Association; S. M. Eveleigh of the B.C. Institute; David Webster, of the Saskatchewan Association; and Joseph Perrault of the Quebec Association of Architects.

It was resolved at the meeting that a committee be named by the president to confer and report on this question.

Other matters considered were the annual reports of the Hon. Secretary and the Hon. Treasurer.

The receipt of a prospectus, covering the course of architecture at the Liverpool University, was also reported.

COUNCIL MEETING, OCTOBER 2ND.

At the second meeting held at the conclusion of the Assembly, Mr. David R. Brown, the newly elected president, was invited to occupy the chair. Mr. Alcide Chausse, hon. secretary, and Mr. Chas. S. Cobb, hon. treasurer, were reelected to office, and other executives chosen as previously reported in the October issue of CONSTRUCTION.

Pro Rata Contribution—The Council confirmed the increase recommended by the hon. treasurer and approved by the Assembly, fixing the pro rata contribution of the provincial associations at $5.00 a year per member, instead of $2.00 as heretofore.

In this connection it is pointed out that of approximately 800 architects belonging to the provincial association at the time of federation (1913), this total membership has since been reduced almost one-half. This was entirely due to the disrupted period through which the country has just passed, and it was only through funds accumulated during the war when for a period of three years no general annual assembly was held, and of which only a surplus of $220.14 now remains, has it been possible for the Institute to hold to the pro rata fee of $2.00 up to now. The necessary expenses, with prospects of certain additional increases, were itemized as follows:

Rental of office	$200.00	
Assistant-Secretary	200.00	
Travelling expenses of officers and members assembly and council meetings	450.00	
Stationery, printing and postage	50.00	
Reporting of Annual Assembly	180.00	
Unforeseen expenses	100.00	
		$1,180.00

Disbursements—The hon. treasurer was authorized to pay the following accounts:

(a) Annual office rent (Montreal) $200.00
(b) Services of Assistant-Secretary 200.00
(c) Hon. Secretary's disbursements.
(d) Necessary expenses in connection with the Thirteenth General Annual Assembly.
(e) Actual travelling expenses of President and other executive on business of the Institute.
(f) Bonus of $25.00 to Assistant-Secretary in connection with the moving of the Institute offices.

Publishing Annual Proceedings—The hon. secretary was authorized to make arrangements with the publishers of Construction to publish in pamphlet form the report of the Ottawa Assembly appearing in the October issue of that publication.

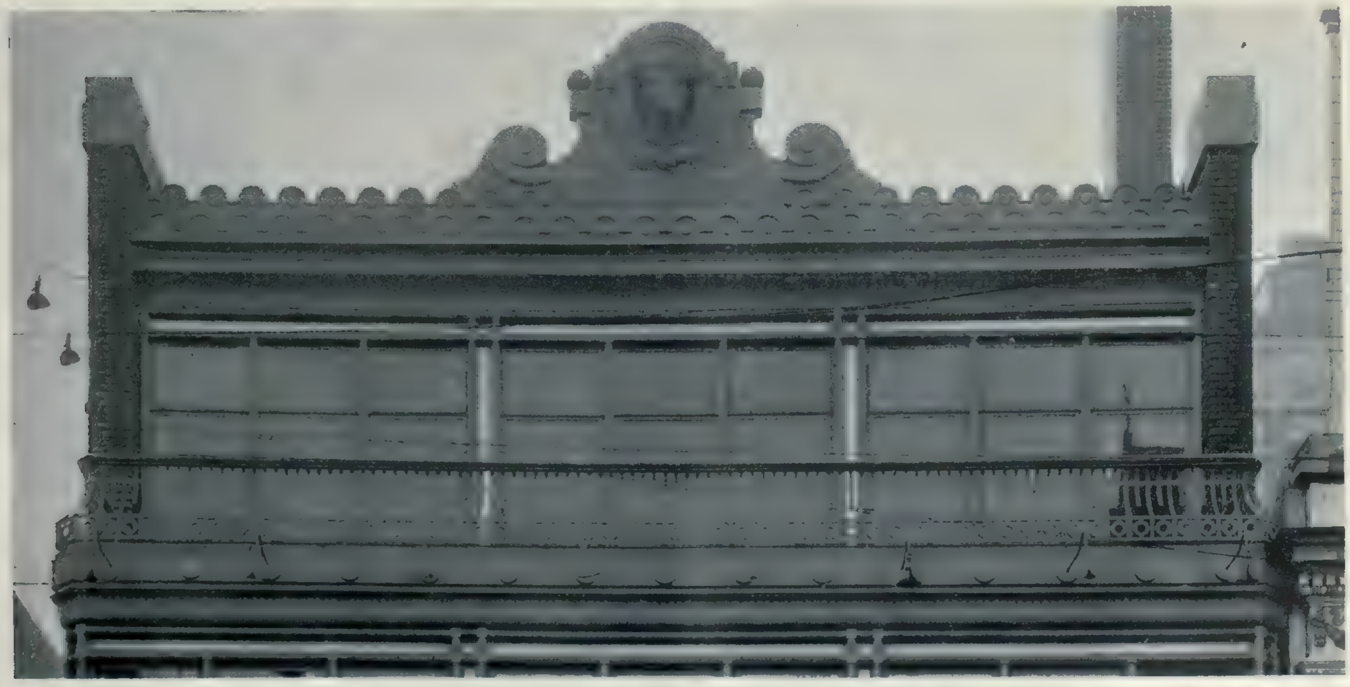
Finance Committee—Messrs. J. P. Hynes (chairman), Forsey Page and Gordon West were appointed members of the finance committee for the ensuing year.

Committee on Urgent Matters—Messrs. David R. Brown (chairman), Joseph Perrault, John S. Archibald, Chas. S. Cobb and Alcide Chausse were appointed a committee to deal with urgent matters which arise between Council meetings. It is understood that the decisions of said committee will be mailed by the hon. secretary to all members of the Council immediately after such decisions are made.

Revision of By-laws, Etc.—It was also decided to strike a committee to be named by the president, to deal with the proposed revisions of the by-laws, schedule of charges, and conditions of competitions.

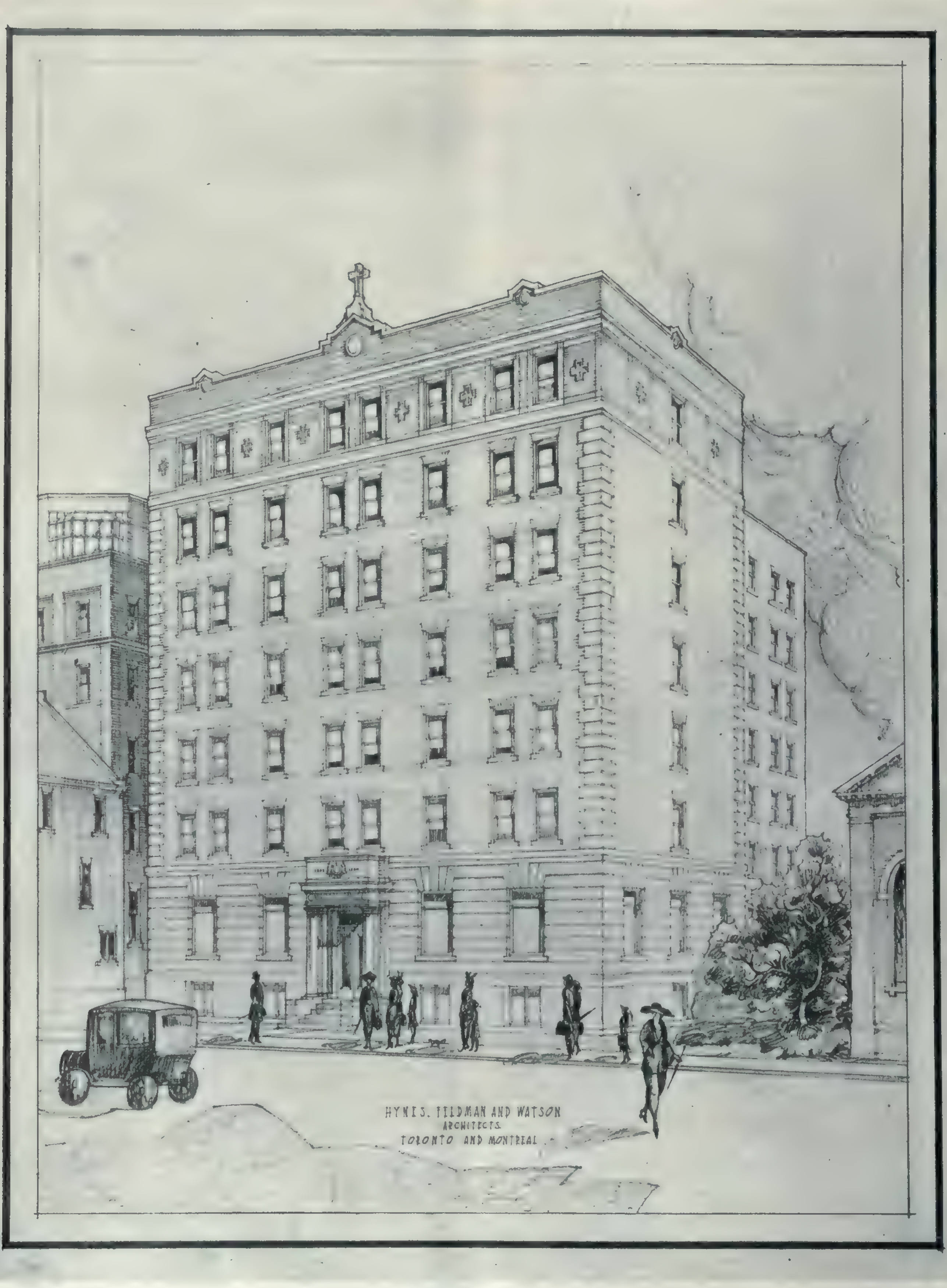
Publication of Year Book—The hon. secretary was instructed to secure the opinion of the several provincial associations in reference to the publication of a year book to contain the charters, by-laws, schedule of charges, code of ethics, conditions of competitions, and list of officers and members of all architectural organizations in Canada.

Next General Annual Assembly—The next general annual assembly is to be held at Winnipeg, subject to the approval of the Winnipeg members, the Council being empowered to make different arrangements in case the selection of some other city should be deemed necessary.



UPPER FACADE OF THE WM. DAVIES CO., LIMITED, QUEEN STREET STORE, TORONTO, WHICH WAS ILLUSTRATED IN THE JULY ISSUE IN AN INCOMPLETED STATE.

HYNES, FELDMAN & WATSON, ARCHITECTS.



PERSPECTIVE VIEW

NEW NURSES' RESIDENCE, ST. MICHAELS HOSPITAL, TORONTO, NOW IN COURSE OF ERECTION.

HYNES, FELDMAN, & WATSON, ARCHITECTS.

Nurses' Home, St. Michael's Hospital, Toronto

The new Nurses' Home of St. Michael's Hospital, Toronto, now in course of erection, will give accommodation for one hundred and fifty nurses, one hundred of whom will have individual rooms, while every nurse will have an individual clothes closet. These rooms occupy the six upper floors of the building, on each of which lavatories are placed permitting every floor to be used as a separate unit. The roof is laid with promenade tile and will be used for open air recreation, being accessible by the main stairs and an automatic electric elevator.

The ground floor has apartments for the head nurse, reception room and library for the nurses and also a large assembly room. The basement has a large room for the auxilliary, small kitchen and lavatory, and trunk and storage rooms.

The building has a frontage of 72 feet on Shuter Street and a depth of 100 feet. It is of reinforced concrete construction with hollow terra cotta tile walls, brick veneered on the external face. Two reinforced concrete trusses cross the first floor, giving a clear span to the ceiling of the assembly room while carrying the six upper floors of the building. The exterior of the front portion of the structure is faced with red pressed brick with stone trimmings, while the rear portion is faced with red stock brick.

The interior throughout is plastered in hard finish and oil painted, the doors, trim and floors being of selected birch finished a dead gloss in natural color. Electricity will be used for the lighting and a forced hot water system for the heating, the lavatory partitions throughout being of the sheet metal finished with white enamel.

◆

Ancient Guilds & Modern Science

The ancient guilds of the City of London, England, are famous the world over for their historic traditions, their wealth, and the munificence of their gifts to education, charities, and public services in general. That they can move with the times is shown by the striking action of the "Worshipful Company of Fan Makers." For centuries this company has confined its attention to ladies' fans, but now it is taking within its range the ventilating fans designed by the engineer. A medal is being offered by the company for the best essay on a subject connected with the theory and practice of ventilation. The Fan Makers' Company has also decided to promote an exhibition in London of smoke-consuming and ventilating appliances for improving the atmosphere of towns and factories.

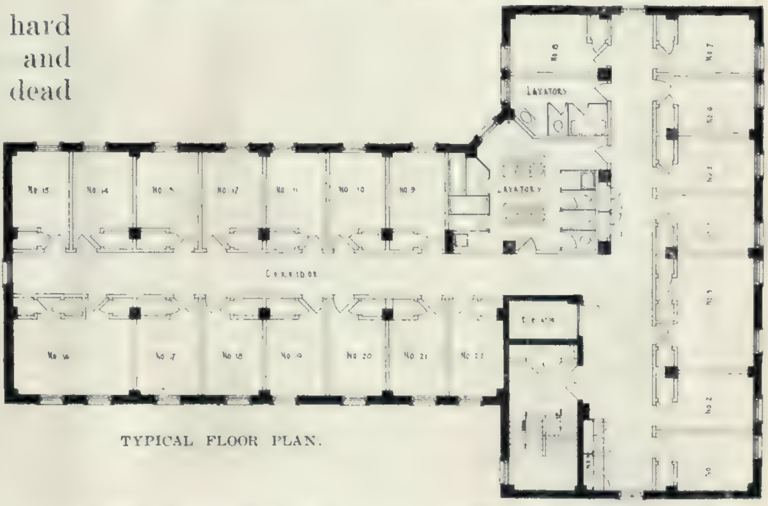
Antiquity of Stone-Paved Streets

The paving of streets is by no means a modern invention, although in the last 30 or 40 years different materials and different methods have been used with more or less success. The people of Carthage are said to have paved their town; the Romans in the time of Augustus had pavements in many of their streets, the Appian Way in Rome, a paved road, was built in 312 B.C. Pavements of blocks of lava, worn into ruts by wheels, were found in Pompeii. Roads built of heavy flags of freestone, of unknown age 1,500 to 2,000 miles in extent, exist in Peru. In Mexico, among the ruins of Palenque, are found pavements of large square blocks of stones.—"Stone."

◆

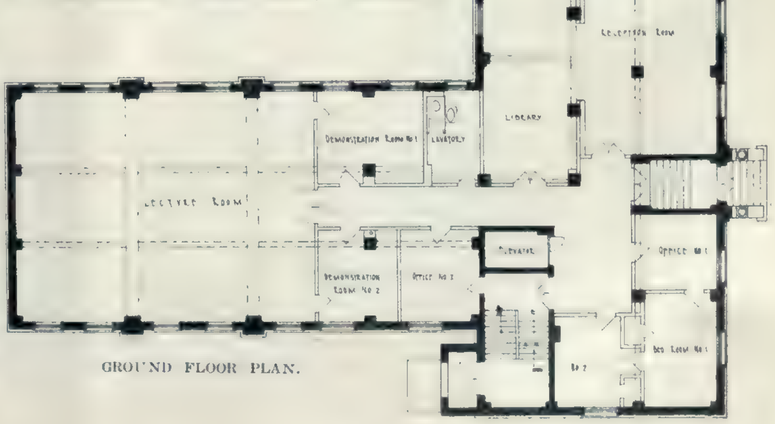
Damming the Clyde

A century ago the River Clyde was fordable at points close to where liners are now docked. Great as the transformation has been, it does not represent the last word in the enterprise of those concerned. The Clyde Navigation Trust, under whose auspices a long and magnificent series of improvements have been carried out, is considering the construction of a barrage at a point somewhere below the harbor to keep the water in the harbor at a constant high level. The question has been referred to a special committee which also has in hand important schemes for the construction of new docks.



TYPICAL FLOOR PLAN.

NEW NURSES' HOME,
ST. MICHAEL'S HOSPITAL, TORONTO.



GROUND FLOOR PLAN.

Community Development

By Dr. C. A. Hodgetts, Department of Health, Ottawa.

An address delivered at the General Annual Assembly of the Royal Architectural Institute of Canada, recently held at Ottawa.

IN being honored by an invitation to speak before the Royal Architectural Institute, I fear my friend Mr. Meredith has committed an "architectural blunder." The opportunity, however, could not be let pass to meet members of your profession with whom I happily became acquainted while serving with the Commission of Conservation in pre-war days, engaged in the pleasant and fascinating task of directing public attention to the necessity of proper and adequate housing and some orderly scheme of town planning.

Whilst acting as Red Cross Commissioner overseas, I realized more than ever before the value of the architect in the designing, erecting and maintenance of temporary buildings for the care of the sick and wounded, for certainly, without the skillful guidance of the architect, my efforts would have been of little avail.

When it came to the building of a 600 bed hospital in Paris, the climax was reached, and I can now certify to the truth of the axiom "fools build," for all the conditions incident to work of this character had completely changed. To carry on work in times of peace in which two governments are interested, is no easy task; in war it is confusion worse confounded. Neither help you and both urge prompt action and immediately tie you up with all the red tape possessed by a War Department which prevents honest endeavor. It required a confirmed order to purchase a few yards of copper wire.

It is only proper to state that what was accomplished in hospital building was due to the skill and ability of the gentleman employed.

It may seem at first glance there is little in common to speak upon which is of interest alike to the members of your profession and that of medicine. As a sanitarian, I have always considered we had one important common interest, and the Great War in my judgment, based on personal observation, has fully demonstrated it to be a fact. For if medicine prevented the spread of disease amongst the millions on the great field of battle, to a degree never before experienced, it can be truthfully said that the proper housing of the soldiers and the multitude of war workers, enabled the performance of duty and service to be carried out to the highest degree of efficiency.

And now in these post-war times, when the struggle is for individual and national existence, and it may be added for the supremacy of a Christian democracy; when in the great upheaval of nations, we find medical thought and action directed into the more practical and more important lines of prevention of disease and the maintenance of a physically efficient people, it must be brought home to each of us that we have much in common.

According to Ruskin, "the architect is one who so disposes and adorns the edifices raised by man, for whatsoever use, that the sight of them may contribute to his mental health, power and pleasure."

If the sight of things of architectural beauty has such an effect, how much greater must be the effect on the health and power of the nation when our homes, our offices, workshops and the many civic amenities are taken into account?

Evidently Ruskin did not consider that an architect's responsibilities, so far as sanitation is concerned, were not summed up in one word "drains."

Of the medical men, Dr. Knox said the lives, limbs, health and spirits of a great part of the subjects of a kingdom depend upon their skill and honesty.

We have, therefore, combined in the two professions more power to make or mar the physical condition of man than is possible by any other two; not even if we couple up law and divinity.

We do know something of the opinion and views of the dangerous leaders; of the still more subtle and dangerous principles which at present dominate in certain parts of Europe, so far as they relate to the doctor, but I have yet to read anywhere what they think of the members of your profession.

George Lansbury is credited by "John Bull" to have said when visiting British soldiers in Russian imprisonment "that the road sweeper should receive the same wages as the doctor, because the former kept down disease by cleaning up the refuse and was doing as much regarding the safety of the race as a doctor." By deduction, your architectural fees, limited as they are now, would be kept down to those of a "hod carrier," for he does much and is an essential factor in house building.

The great difference, however, between our two callings is, we bury our mistakes, whilst yours are perpetuated in costly marble, or to be less poetic and more correct, in ferro-concrete, bricks and mortar.

If statistics are correct, the truth is out, for the medical examination of the greater part of the male population reveals the fact that many of the men, at least, are physical unfits, and they have become thus during a period when we prided ourselves we were becoming more highly civilized. The decadence is ascribed to various causes, amongst them are those of bad housing, environment and heredity, not to speak of his innate sin.

If the facts presented be true, and as one who has seen the evidence in England and Ireland whilst serving under the Ministry of National Service, I must say they are confirmed; it is quite apparent in the building up of this nation that we have each duties and responsibilities in regard to man and much that has to do with his physical condition and temporal happiness.

According to Aristotle, "Man is a civic animal," and we fear not even the so-called League of Nations or the League of the Red Cross with its untold millions, will accomplish much to improve his immediate condition and his natural frailties or induce him to return to a rural life. The evidence of his civic nature is before us everywhere we go, as witness our huge cities with their teeming millions packed, the most of them, like sardines in a box.

We see in our fair Dominion the rapid growth of Montreal, Toronto and Winnipeg, and hundreds of other lesser cities, and this too in a country which is calling for a larger rural population to develop our natural resources of which we so loudly and so proudly boast.

Because "man is nature's sole mistake" (and Canadians, being men, continue to err as their ancestors have done), does it follow that he must undergo a process of regeneration before we can hope for the adoption of general civic amenities by which alone the attainment of higher physical standards can be realized? This is no doubt in part true, but we fear there is more truth in the words of Southey that "man creates the evil he endures," and it is these evils of his creative genius which we have to contend against.

It is in the erection of the individual homes and buildings and their aggregation into towns and cities that our interest, though varied, meets, and that interest is the common object of providing the amenities for our fellow men. A town is not made by one man, or by one man's ideas; it is an organic thing; the product of the efforts, aims and desires of many men, and I would add "women." Its architecture is determined by material conditions, by the needs real or supposed, the traditions, the limitations and the culture of those for whom it is made and of those who make it.

In brief, it is the skilled cultivation of life, of experience, of opportunity which go to the making of a town, very similarly as they go to the making of man himself.

The concentration of industry, the growing contrast in the conditions of life offered in the country and town, have their influence in drawing people in vast numbers to forsake the hillside cottage, or the sleepy village, in favor of the dusty street in the overcrowded town slums.

We will not discuss the motives; time will not permit; but, whatever they are, it should be our aim to secure conditions in the growing city that they may find new ties, new interests and new hopes, and that general atmosphere which will create for them livable homes and new aspirations.

It must be our work to transform these mere aggregations of people into consciously organized communities. We must teach them to think in the words of Aristotle "that a city is a place where men live a common life for a noble end." We in Canada have become used to living amongst surroundings in which beauty has little or no place, so that we do not realize what a remarkable and unique feature the ugliness of modern town life is.

In the aggregation of our homes as we find them in our Canadian cities, we have neglected the amenities of life. We have apparently forgotten that endless rows of brick boxes looking out on dreary streets and backed by squalid backyards are not really homes for people, and indeed never can become such, however complete may be the drainage system or pure the water supply. There is more—these do not suffice—there is needed the modifying touch of art which will give completeness and increase their value.

"Art is the well doing of what needs doing," and much that has been done in the past lacked the insight of imagination and the generosity of treatment which would have constituted the work well done. It is from this well doing that beauty springs. It is the lack of beauty, of the amenities of life, more than anything else which obliges us to admit our work of town building in the past has not been well done.

We shall need to secure more open ground, air space and sunlight for each dwelling. We shall need to make proper provision for parks and playgrounds—to control our streets; to plan their direction, width and character so that they may in the highest degree possible minister to the convenience of the community.

We are too much given to regarding art as something added from without—some expensive trimming put on; rather art springs from the spirit of the artist; it comes from within and must permeate the work. Beauty is a necessity of life if we are to live as nature means us to, unless we are content to be less than men.

While the mass of people in hovels and slums and our children grow up far from the sight and pleasure of green fields and flowers, our land is laid out solely to serve the interests of individual owners, without regard to the common needs. We must lay a good foundation.

Does the town need a market place? If so, build the best, most convenient and comely we can design—not erect a corrugated iron shed for the market and spend what would have done this work well in decorating the town park with ornamental railings and the like.

We may enact building and sanitary laws, which as a rule are altogether too rigid; we may propound sanitary theories and give the best advice both as architects and sanitarians, but unless we can persuade the general population that it is good for them to obey the laws and follow the advice given, the upward movement will not follow and our homes will continue to be one of the causes of disease and physical disability.

We must teach the people that a nation is only truly great and worthy of the land and scenes it has inherited when by its acts and arts it renders them more desirable for their children; and what a noble heritage of both land and scenes this noble Canada of ours possesses!

O. A. A. Notes

As a result of the impetus given by the O.A.A. Council meeting in Hamilton on October 9th, the architects of that city have been busy re-organizing with a view to again putting the local chapter on a sound basis. Since then officers have been elected and two very successful meetings held. Stanley T. J. Fryer has been made chairman, George T. Evans secretary-treasurer, and B. Frank Kelly, Hamilton's representative on the O.A.A. Council, as a member of all committees ex-officio.

The first meeting was in the nature of a general invitation to all architects of the city to get together, and met with a very encouraging response, fourteen members of the profession attending an evening dinner held on October 12th at the Wentworth Arms.

The chairman spoke briefly of the benefits of membership in the O.A.A., and urged all present to make application or to qualify themselves for membership. He also explained that the meetings called by the Chapter were for the benefit of the entire profession in the city, and that all non-affiliated architects were invited to become club members, with all privileges except the right to vote on matters pertaining to the Chapter.

The second meeting, held at a subsequent date, consisted of a noon luncheon at the Wentworth Arms with fifteen architects in attendance. It was decided that each member should be assessed $2.00 for present incidental expenses and that at the next meeting a definite yearly fee would be agreed upon, also that the club would take up the matter of permanent organization and arrange for regular meeting nights.

The secretary was instructed to secure information regarding suitable quarters for a permanent club room and to report at the next meeting.

As a result of the activities up to the present time, ten local architects have signified their intention of making application for membership in the association.

The secretary has compiled a complete list of all architects in the city together with addresses and phone numbers. A complete list of all architectural draughtsmen in the city is now in course of preparation, and draughtsmen will be urged to report to the secretary when seeking a position or change.

The secretary has also interviewed the city editors of the local papers, outlining the aims of the association and enlisting sympathy and co-operation in the Chapter's activities, with very gratifying results.

A list of all books dealing with architectural and allied subjects in the public library will be compiled for the information of members.

ADVISORY CONFERENCE COMMITTEE DRAFT BILL.

A special meeting of the Council of the Ontario Association of Architects was held on November 17th to discuss the draft bill presented by the Advisory Conference Committee for an Act respecting the practice of architecture and engineering in the Province of Ontario. As no definite decision was arrived at and as the matter is still under consideration, a report on this subject will be issued by the Council at a subsequent date.

NEW MEMBERS.

New members of the Ontario Association of Architects reported by the Board of Admission are Gordon J. Hutton, Stewart McPhie and Herbert E. Murton, all of Hamilton.

Five additional applications have been received by the Board and are now being given consideration.

George E. Evans, associate, Hamilton, Ont., has been made a full member, and W. A. Langton, Toronto, nominated for honorary membership.

E. L. Horwood, Ottawa, having ceased practising, has withdrawn his membership in the association.

THE PUBLICITY CAMPAIGN.

No one can doubt the value of the publicity campaign of the Ontario Association of Architects to its members when it even attracts attention in so remote a place as California. A recent letter received by the secretary from the city of Pasedena asks for detailed information as to the system of propaganda adopted. Moreover, considerable comment has appeared in the daily and technical press, while numerous enquiries have been received from architects in other provinces and elsewhere, all of which only tend to show that both in Canada and the United States the question of publicity is a live one with the profession. It is likewise apparent that if these advertisements are being read in other parts of Canada and the United States, they are to a greater degree read by the lay public of Ontario, and that is the main thing and the best reason why the publicity campaign should be continued.

U. S. Registration Laws

The following is a skeleton program of the St. Louis (Mo.) meeting of the Architectural Registration Boards in the United States, which is being held as this issue goes to press, and which in view of similar subjects now being discussed in Canada may be deemed of timely interest. The subjects being considered are:

1. A general survey of conditions affecting registration laws, an historical sketch of the movement and purpose of the Council of Architectural Registration Boards, by Emil Lorch, President of the Council, and Vice-President of the Michigan State Board for the Registration of Architects, Engineers and Surveyors.

2. A comparative study of architectural registration laws now effective in the United States, by William P. Bannister, Secretary of the New York Registration Board for Architects.

3. The proposed standard form of registration law of the American Institute of Architects, by Richard E. Schmidt, Chairman, Committee on Registration Laws, American Institute of Architects.

4. Joint laws for architects and engineers.

(a) Report on the recent conference between the committees on co-operation between engineers and architects representing Engineering Council and the American Institute of Architects, by Ernest J. Russell, St. Louis, one of the Institute representatives at the conference.

(b) The registration law for architects, engineers and surveyors in Michigan, by the Chairman.

(c) Are joint laws desirable? General discussion.

5. The administration of registration laws. (A) This is taken up as a general subject with a view to bringing out the experience of registration boards as to form of organization, conduct of work, general and special problems, legal decisions, titles of firms, co-operation of technical organizations with registration bodies, evasions, etc.

(a) In Illinois, by Emery S. Hall, Chairman of the Committee of Architects, and E. C. Dodds, Superintendent of the Department of Education and Registration of the State of Illinois.

(b) In California, by Sylvain Schnaittacher, Secretary California Registration Board for Architects.

(c) In Louisiana, by Charles A. Fevrot of the Louisiana Board for Architects.

(d) In Idaho, by Paul Davis, Director of Bureau of License, Department of Law and Enforcement.

(e) In New Jersey, by Hugh Roberts, Member of the New Jersey Board of Registration for Architects.

(f) In New York, by D. Everett Waid, President New York Registration Board for Architects.

6. General Topic: To what extent is reciprocity possible between States in which registration laws are in force? Each delegate is asked to present the attitude and practice of his Board with respect to the following:

(a) Under what conditions shall architects who have registered without examination in their State of origin be registered in other States?

(b) Under what conditions shall an architect who was qualified by examination be accepted in other States?

(c) To what extent is it desirable and possible to establish a common standard of examinations?

(d) What modifications should be made to existing laws to facilitate reciprocity.

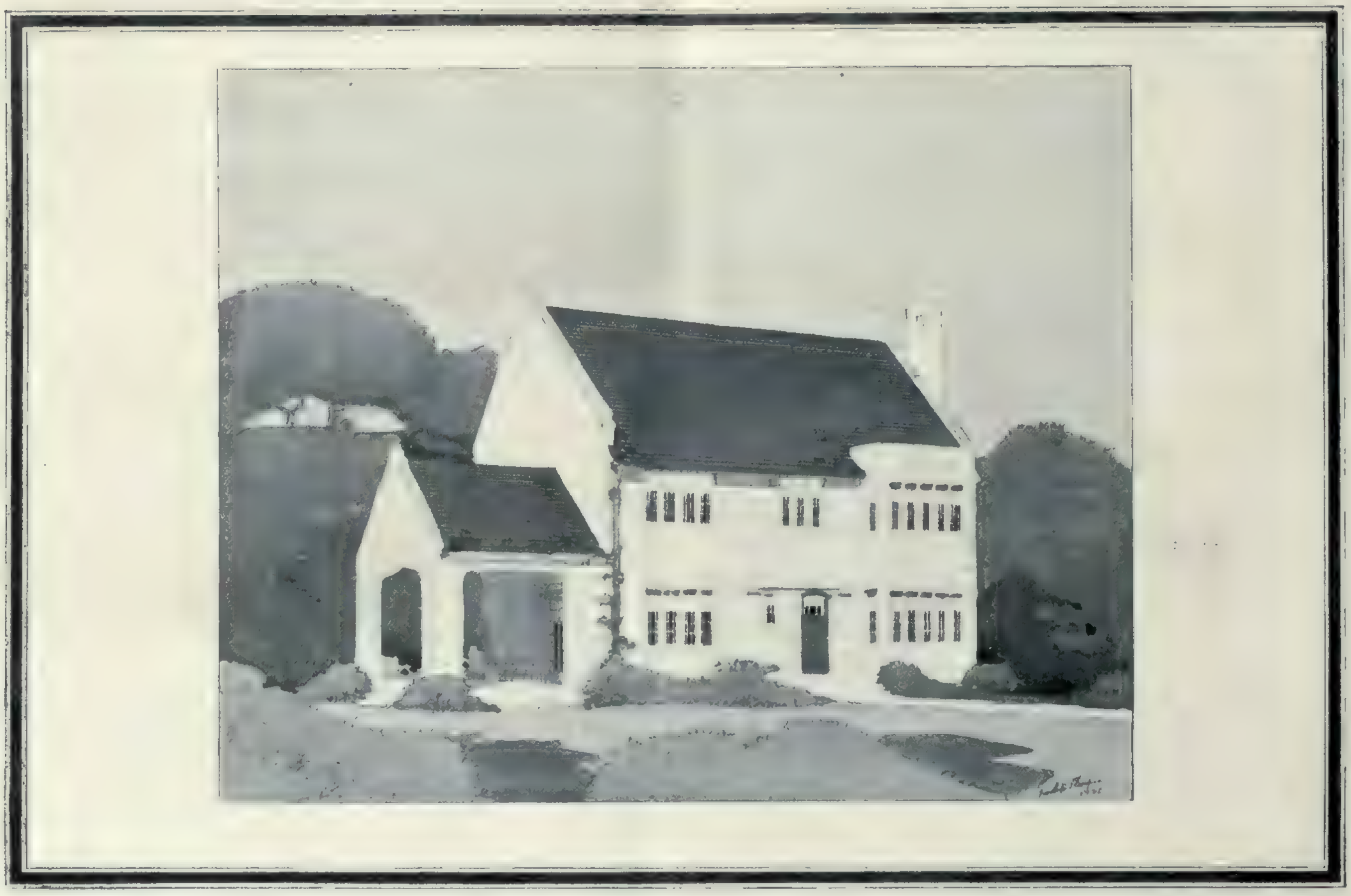
(e) To what extent is it possible and desirable to establish a central clearing office for all architectural boards?

7. Reports of committees and miscellaneous business.

At the conclusion of the meeting the Board of Directors of the American Institute of Architects will meet with representatives from the middle west chapters.

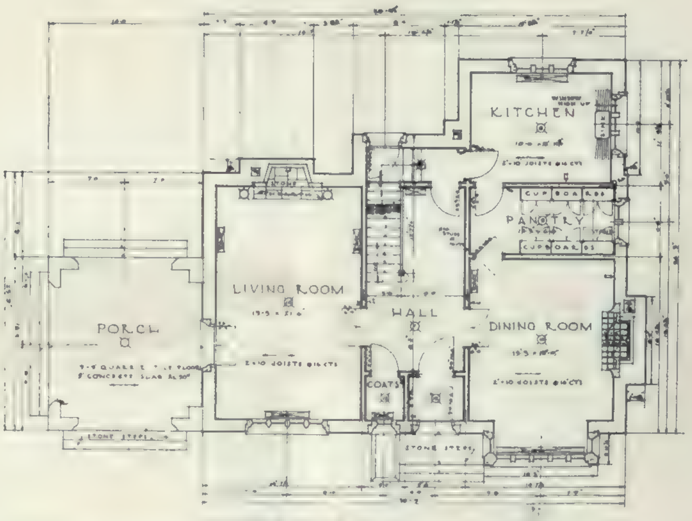
U. S. Industrial Plants in Canada

The reasons why American manufacturers are establishing plants in Canada at the rate of one a week, are summarized in a booklet just issued by the Union Bank of Canada entitled "A Canadian Plant—Why?" In the face of the growing strength of the "Made-in-Canada" movement and the extension of the British Preferential Tariff, Canada, the booklet claims, is the logical location for a plant with which to handle British and Canadian trade.



PERSPECTIVE.

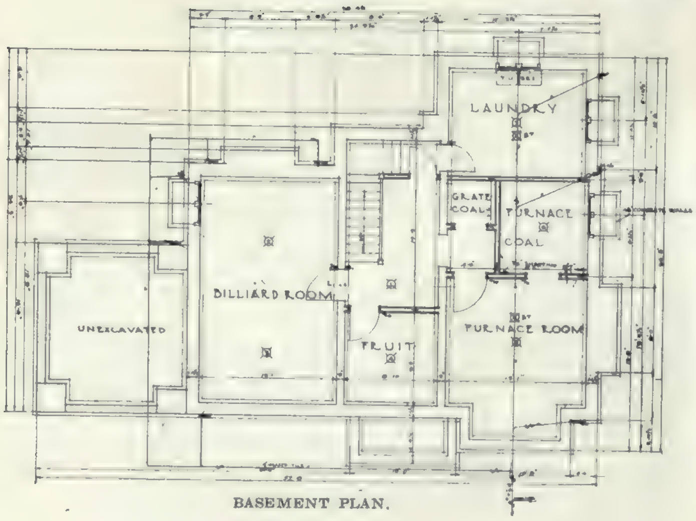
STUDENTS' WORK.
SECOND YEAR CLASS,
TORONTO TECHNICAL
SCHOOL.



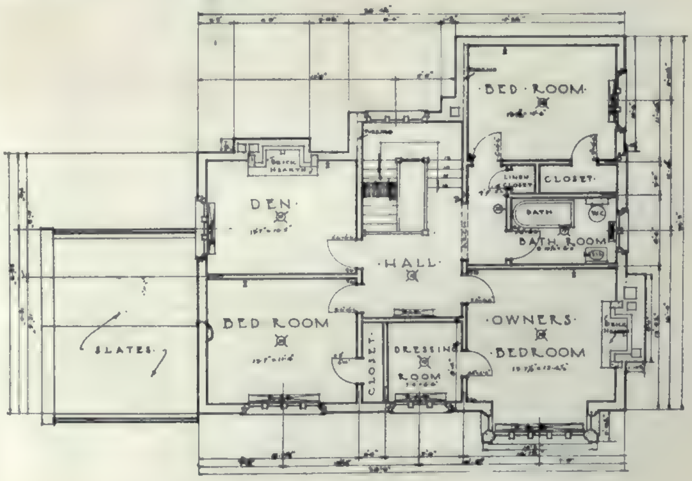
GROUND FLOOR PLAN

DESIGN BY
FRANK B. THOMPSON.

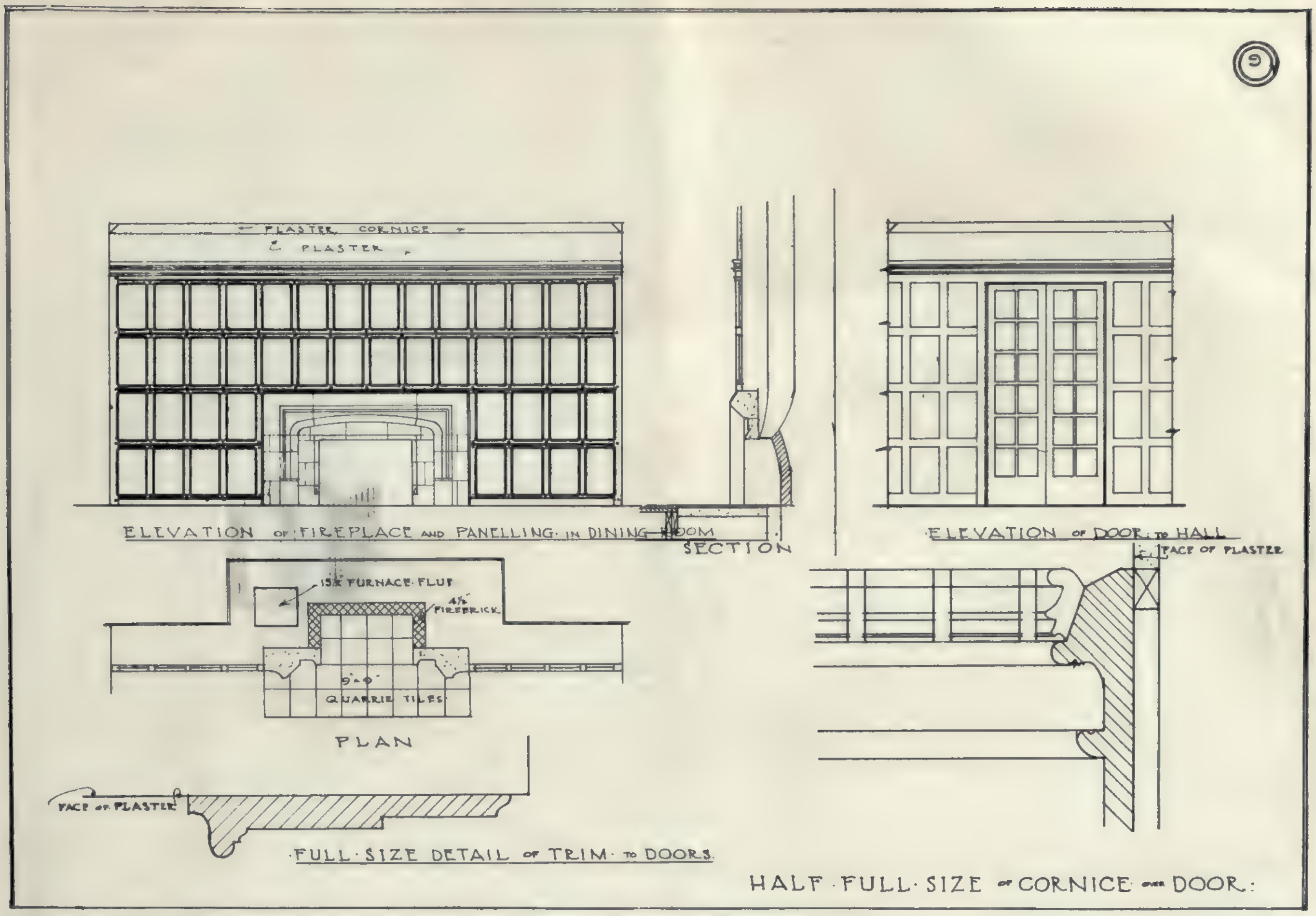
FIRST AWARD, (TERM OF 1919-1920), AND FIRST PRIZE FOR PERSPECTIVE AND SECOND PRIZE FOR DESIGN, AT THE CANADIAN NATIONAL EXHIBITION.



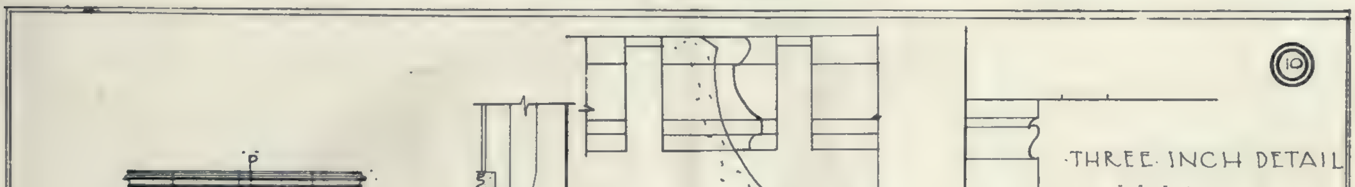
BASEMENT PLAN.



UPPER FLOOR PLAN.


9
PLASTER CORNICE
& PLASTER
ELEVATION OF FIREPLACE AND PANELLING IN DINING ROOM
SECTION
ELEVATION OF DOOR TO HALL
FACE OF PLASTER
15 X FURNACE FLUE
4½ FIREBRICK
5'-0"
QUARRIE TILES
PLAN
FACE OF PLASTER
FULL SIZE DETAIL OF TRIM TO DOORS
HALF FULL SIZE OF CORNICE OVER DOOR:

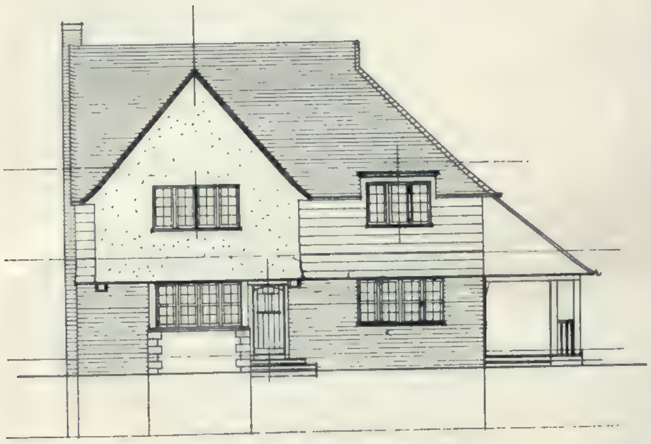
DETAIL OF DINING ROOM.



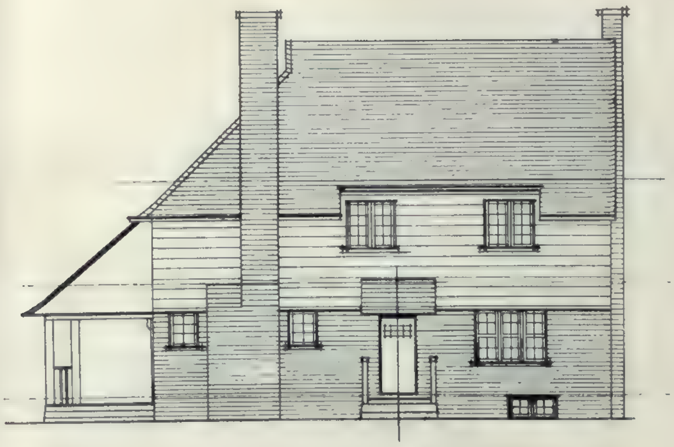
DETAILS OF LIVING ROOM.

STUDENTS' WORK, SECOND YEAR CLASS, TORONTO TECHNICAL SCHOOL. (TERM, 1919-1920.)

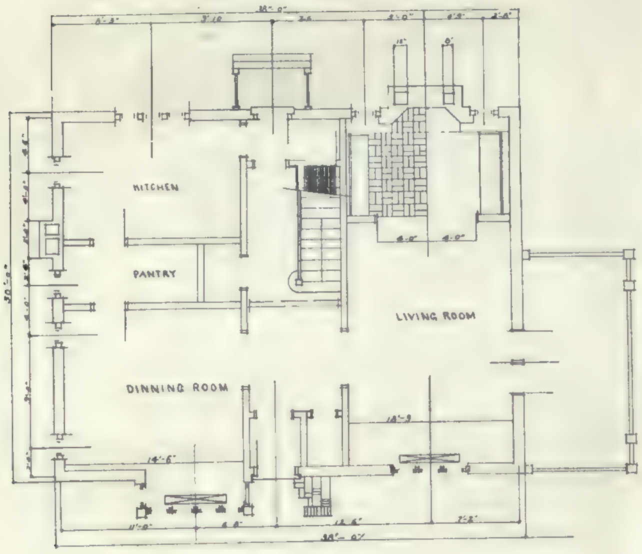
DESIGN BY FRANK B. THOMPSON.



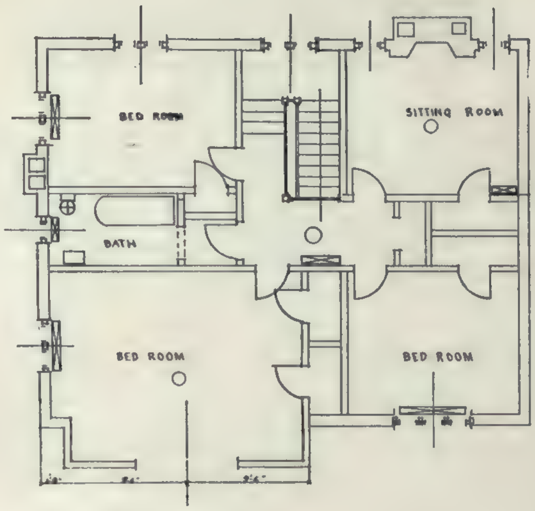
FRONT ELEVATION.



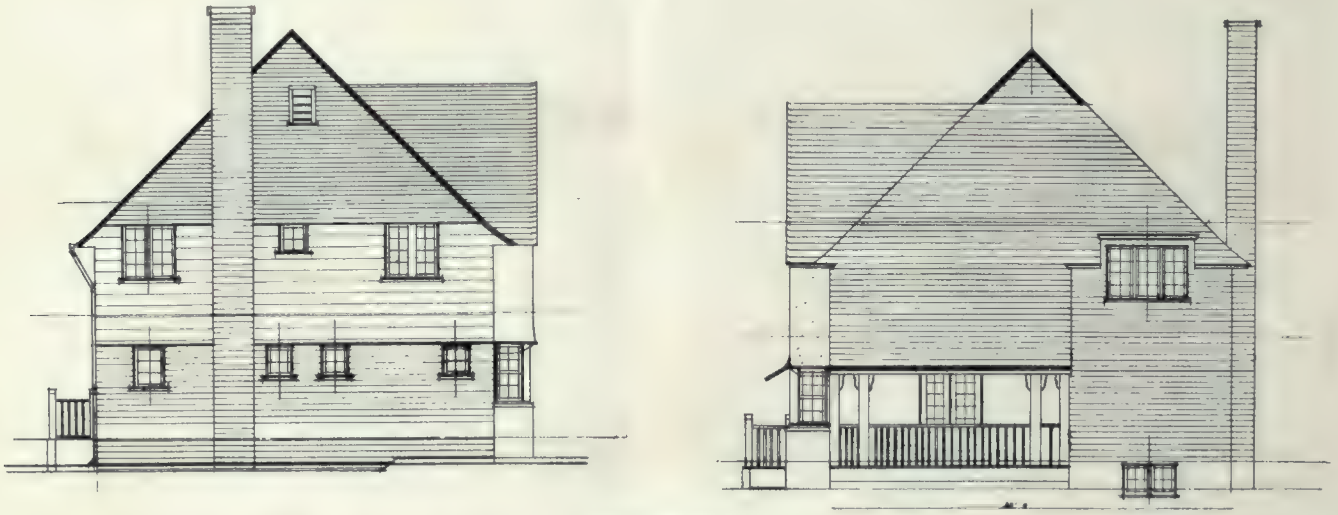
REAR ELEVATION.



GROUND FLOOR PLAN.



SECOND FLOOR PLAN



END ELEVATIONS.

STUDENTS' WORK, SECOND YEAR CLASS, TORONTO TECHNICAL SCHOOL. (TERM, 1919-1920.)

SECOND AWARD: C. D. STUART.

Hydro-Electric in Great Britain

Owing to the high cost of fuel and the demand for increased production, many British mill-owners are installing water turbines to use moderate heads of water and are using steam plant as an auxiliary. Both plants generate electricity, the hydro plant taking the constant load and the steam plant dealing with additional demands in the busiest hours. The arrangements which several of the leading British electrical firms are making to carry out complete hydro-electrical installations of every size will encourage this movement towards power economy.

CONSTRUCTION

A · JOURNAL · FOR · THE ARCHITECTURAL
ENGINEERING · AND · CONTRACTING
INTERESTS · OF · CANADA

H. GAGNIER, LIMITED, PUBLISHERS
Corner Richmond and Sheppard Streets.
TORONTO - - - - CANADA

M. B. TOUTLOFF, Editor
W. H. HEWITT, Advertising Manager.

BRANCH OFFICES:
MONTREAL—171 St. James Street,
C. S. Soutter, Representative.
WINNIPEG—336 Qu'Appelle Street,
F. C. Pickwell, Representative.
NEW YORK—505 Fifth Avenue.
F. Watson, Representative.
CHICAGO—608 Otis Bldg.
C. E. Goodman, Representative.

CORRESPONDENCE.—All correspondence should be addressed to "CONSTRUCTION," Corner Richmond and Sheppard Streets, Toronto, Canada.

SUBSCRIPTIONS.—Canada and Great Britain, $3.00 per annum. United States, the Continent and all Postal Union countries, $4.00 per annum, in advance **Single copies, 50c.**

ADVERTISEMENTS.—Changes of, or new advertisements must reach the Head Office not later than the twentieth of the month preceding publication to ensure insertion. Mailing date is on the tenth of each month. Advertising rates on application.

CONTRIBUTIONS.—The Editor will be glad to consider contributions dealing with matters of general interest to the readers of this Journal. When payment is desired, this fact should be stated. We are always glad to receive the loan of photographs and plans of interesting Canadian work. The originals will be carefully preserved and returned.

Entered as Second Class Matter in the Post Office at Toronto, Canada.

Vol. XIII. Toronto, Nov. 1920 No. 11

The Live Stock Arena

The published perspective of the proposed Live Stock Arena to be built at the Canadian National Exhibition, possesses little of that standard of merit which one would expect to find in such an important structure as is intended. If carried out as proposed it will result architectually in a building decidedly "Philadelphia Centennial" in type, or at least strikingly reminiscent of that period. Certainly it achieves no architectural distinction, and breathes none of that spirit which has made modern exhibition buildings in other countries such models of excellence in type. Perhaps the author has been influenced so that he was unable to give this structure the artistic consideration which it deserved, but inasmuch as it will be the first of a number of subsidiary structures, and will influence the design of the buildings to follow, it should be designed with a care as to dignity and chasteness. It not only has to please the people of to-day, but must also hold the admiration of coming generations. The fact that the tender have doubled the appropriation voted by the Toronto ratepayers, gives the Exhibition Board an opportunity to reconsider the proposition in a more favorable light. It would indeed be advisable in this connection for the management to consult with the committee of architects recently appointed to devolve a more comprehensive scheme as to future extensions and developments at the Exhibition grounds. To do a thing well is to begin well, and the real beginning of a high standard of Exhibition architecture in Canada should start with the building in question.

Standard Code of Practice

The conference of the Canadian Building and Construction Industries to be held at Winnipeg, January 19, 20 and 21 next, will, among other matters take up the question of the pressing need in Canada of a standard code of practice which will be fair to owner, architect and material dealer, and also protect the general and sub-contractor. The subject is an important one, and will be widely discussed with a view to the adoption of such a code. A standard form of contract is another matter which will come before the conference and a very interesting committee report is promised on this subject. A large attendance of members is anticipated and other features of the programme are to be announced shortly.

Town Planning Journal

CONSTRUCTION extends hearty congratulations to Mr. Alfred Buckley, M.A., of the Town Planning Branch, Commission of Conservation, and to those associated with him editorially, on the very excellent character of the first issue of the "Journal of the Town Planning Institute of Canada."

It is not only a timely and informative publication, but is one which will serve a very necessary and useful purpose. The rather gratifying strides which town planning is making in Canada is perhaps best indicated by the growth of the Town Planning Institute itself which now has a membership of 117 reaching from the Maritime to the Pacific provinces. It is with a view to keeping its members informed as to town planning legislation and contemplated developments, as well as the large number of schemes in actual progress, that the journal is being published. It editorially deals with the general subject of town planning, the high taxation of cities resulting from the lack of proper and systematic growth, the millions of dollars of peoples' money being spent by municipalities in rectifying their own mistakes, and the special need in Canada for a broad consideration of proper methods of development and of men who are qualified to do this work.

Personal

Mr. Stanley T. J. Fryer, of the architectural firm of Fryer & Evans, Home Bank Building, Hamilton, Ont., is still receiving from time to time circulars and other matter, addressed Deputy Vocational Officer for Ontario, Dept. S.C.R., Toronto. Mr. Fryer wishes to advise manufacturers and others that he is no longer connected with that position, having resigned at the end of August when he returned to practice at the above address.

New Toggle Snap and Flush Switches

A new type of toggle surface switches which it is said electrically conforms to the most rigid requirements, besides being mechanically built to resist the most severe duty, is announced by the Harvey-Hubbell Company. The advantages claimed for these switches are (1) that they are more attractive and stronger than the ordinary switch; (2) that the movement is positive and the make-and-break of the circuit quick and snappy; and (3) that the switch is self-indicating, the position of the lever showing at a glance whether the current is "on" or "off" without any marker or dial. They are more fully described with price lists in Bulletin 16-18 which the company has just issued, and which is in loose-leaf form to permit of ready insertion in the Harvey-Hubbell catalogue No. 16.

Bulletin 16-12 gives similar information in reference to the Hubbell Toggle Flush Switches which the company has recently added to its various lines.

New Condulet Material

The Crouse-Hinds Company, Toronto, has recently issued "Bulletin 1000P" which describes metal reflectors and holophane vapor-proof refractors for the V and VH series of condulets. Considerable information is given as to lamp sizes, reflector holders, reflectors, prices, etc.

Cement Association Opens Canadian Office

The Portland Cement Association, with head office at 111 West Washington Street, Chicago, announces the opening of a Canadian office in the Birks Building, 718 Granville Street, Vancouver, B.C., in charge of A. E. Foreman as district engineer.

Mr. Foreman, who is a native of Canada, has since 1890 made his home in British Columbia, where he has become well known through numerous engineering connections, last of which was Chief Engineer of the Department of Public Works, Victoria, B.C., which position he resigned to join the forces of the Portland Cement Association.

Mr. Foreman was graduated from McGill University in 1903. After a year's travel and several years spent in accumulating general business experience, he formed a connection with the Concrete Engineering and Construction Co. of Vancouver, of which firm he was Secretary and General Manager from 1907 to 1909. For a year following, he was a member of the firm of Dutcher & Foreman, Consulting Engineers of Vancouver. Since 1910 he has had various engineering connections, among which are following: Resident Engineer in charge of construction of Hydro Electric Power Development at Revelstoke, B.C.; Supervising Engineer on special harbor work for Victoria, B.C.; Assistant City Engineer, Victoria, B.C.

In addition to his many other activities, Mr. Foreman finds time to maintain official relations with a number of engineering and other societies, and at the present time is President of the Canadian Good Roads Association.

CONTRACTORS and SUB-CONTRACTORS

LOEW'S UPTOWN THEATRE, TORONTO.

General Contractors, P. H. Secord & Sons, Construction Co., Ltd.
Carpets and Rugs, Murray-Kay Limited.
Doors and Window Trim, Batts Limited.
Concrete Work, P. H. Secord & Sons.
Electric Fixtures, Black & Boyd, N.Y.C.
Electric Wiring and Apparatus, Bennett & Wright Co.
Metal Lath, Trussed Concrete Steel Co.
Fire Alarm System, Dominion Messenger & Signal Co.
Fire Doors, Robertson-Olsen.
Fire Escapes, Luxfer Prism Co.
Fire Extinguishers, American-La France Fire Engine Co.
Furniture, Murray-Kay, Limited.
Glass (Plate), Consolidated Plate Glass Co.
Glass (Wired), W. E. Dillon.
Hardware, Belleville Hardware Co.
Hardware, Kent-Garvin.
Woodwork, Batts, Ltd.
Inter-Phone System, Northern Electric Co.
Marble, Marbles & Tiles, Ltd.
Ornamental Iron, Luxfer Prism Co.
Painting (Decorative), A. Valemr.
Painting (Exterior), L. G. Roberts Co.
Plumbing, Bennett & Wright.
Plaster Work (Ceiling), R. C. Dancy.
Reinforcing Steel. Baines & Peckover.
Radiators (Manufacturers), Dominion Radiators Co.
Roofing, Barrett Specification.
Roofing, Johns-Manville.
Sprinkler Equipment, Bennett & Wright.
Stone, Geo. Oakley & Son, Ltd.
Structural Steel, Dominion Bridge Co.
Hollow Tile, National Fireproofing Co.
Vacuum Cleaners (Spencer Tarbine). Bennett & Wright.
Vaults, Goldie & McCulloch Co., Ltd.

PANTAGES THEATRE, TORONTO.

General Contractors, Jackson-Lewis Co.
Brick, Don Valley Brick Works.
Boilers (Spencer), A. Welch & Sons, Ltd.
Carpets and Rugs, Murray-Kay, Limited.
Doors and Window Trim, Batts, Ltd.
Concrete Work, Jackson-Lewis Co.
Electric Fixtures, Black & Boyd.
Electric Wiring, Ramsden & Roxborough.
Metal Lath, Trussed Concrete Steel Co.
Fire Alarm System, Dominion Messenger & Signal Co.
Fire Doors, Robertson-Olsen.
Fire Escapes, Canada Wire & Iron Goods Co.
Fire Extinguishers, America-La France Fire Engine Co.
Furniture, T. Eaton Co., Ltd.
Glass (Plate), Consolidated Plate Glass Co.
Glass (Wired), Hobbs Mfg. Co.
Hardware, Belleville Hardware Co.
Hardware, Aikenhead Hardware Co.
Heat Regulating System, Johnston Service.
Inter-Phone System, Northern Electric Co.
Marble, J. A. Billerman.
Ornamental Iron, Canada Wire & Iron Goods Co.
Painting (Decorative), Wm. Eckart Studios.
Painting, Barrington Bros.
Plumbing Fixtures, Maulson-Buchanan, Ltd.
Plumbing, A. Welch & Sons.
Plaster Work, W. J. Hynes, Ltd.
Power Machinery, Canadian Westinghouse Co., Ltd.
Radiators (Manufacturers), Gurney Foundry Co.
Roofing, Keystone Fireproofing Co.
Sprinkler Equipment, International Sprinkler.
Stone (Artificial), Peerless Artificial Stone, Ltd
Structural Iron & Steel, Canadian Allis-Chalmers, Ltd.
Tile, Ebsary Fireproofing & Gypsum Block Co.
Vacuum Cleaners (Spencer Turbine). Bennett & Wright Co.
Vaults, Goldie & McCulloch Co., Ltd.
Woodwork, Batts, Ltd.

CONSTRUCTION

Toronto, December, 1920 Vol. XIII., No. 12

CONTENTS

OTTAWA CIVIC HOSPITAL 371

CONCRETE IN ALKALI SOILS AND WATERS 376
By A. S. Dawson, M.E.I.C., Chief Engineer, Department of National Resources, Canadian Pacific Railway.

NEW OFFICE AND FACTORY OF THE DUNLOP TIRE & RUBBER GOODS COMPANY, TORONTO 383

PAN-AMERICAN ARCHITECT'S RESOLUTIONS 388

COST ACCOUNTING AND EFFICIENCY 389

TWO LAKE SIMCOE HOUSES 391

THE FLAT FEE AS A MEASURE OF EQUITY 395

REPORT OF NEW YORK ARCHITECTS ON HOUSING 396

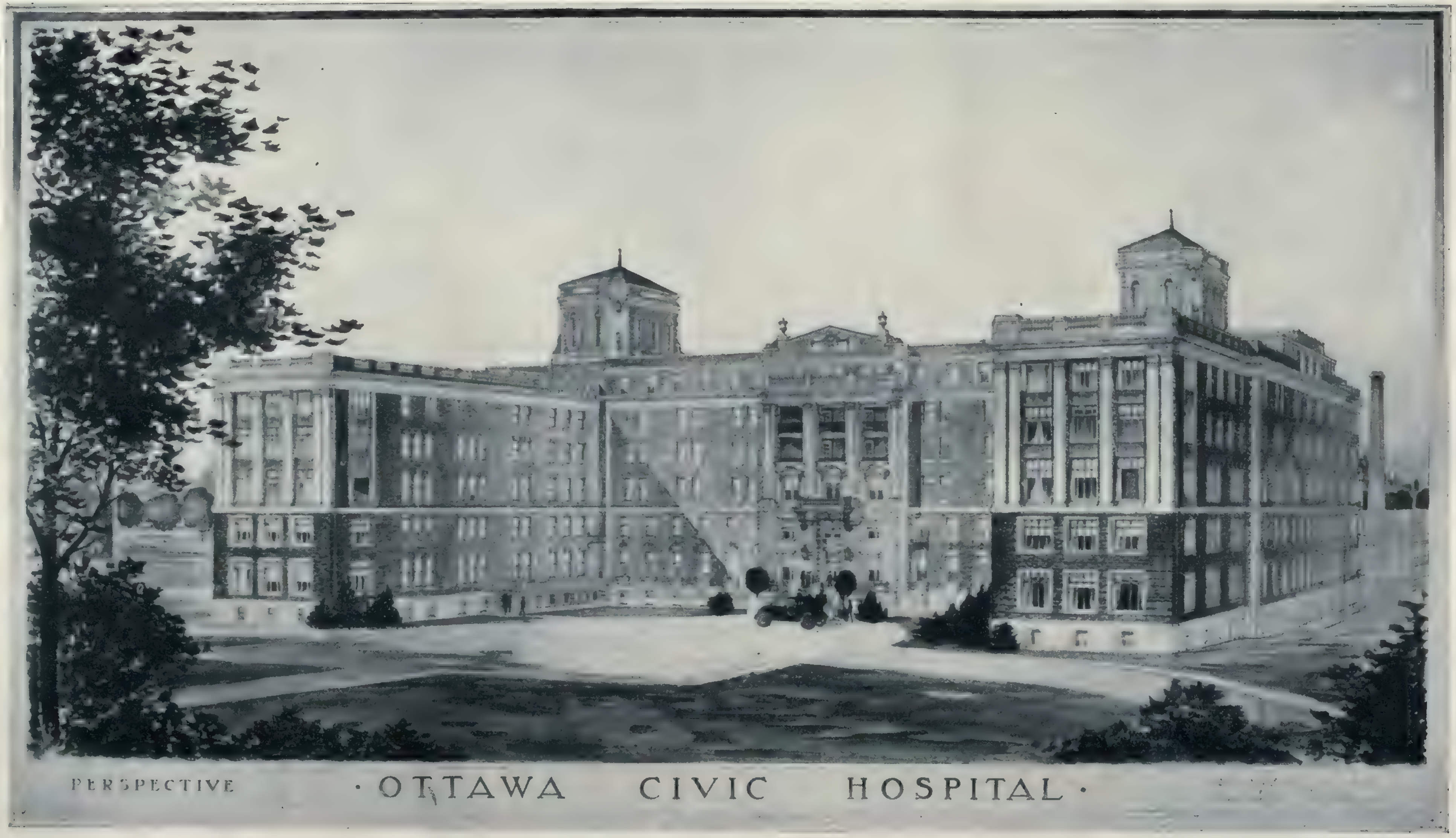
EDITORIAL 399

INTERIOR VIEWS, J. N. GREENSHIELD'S RESIDENCE, DANVILLE, QUE. 400

Frontispiece

PERSPECTIVE VIEW, OTTAWA CIVIC HOSPITAL 370

H. GAGNIER, Limited, Publishers
GRAPHIC ARTS BLDG., TORONTO, CANADA
BRANCH OFFICES
MONTREAL NEW YORK

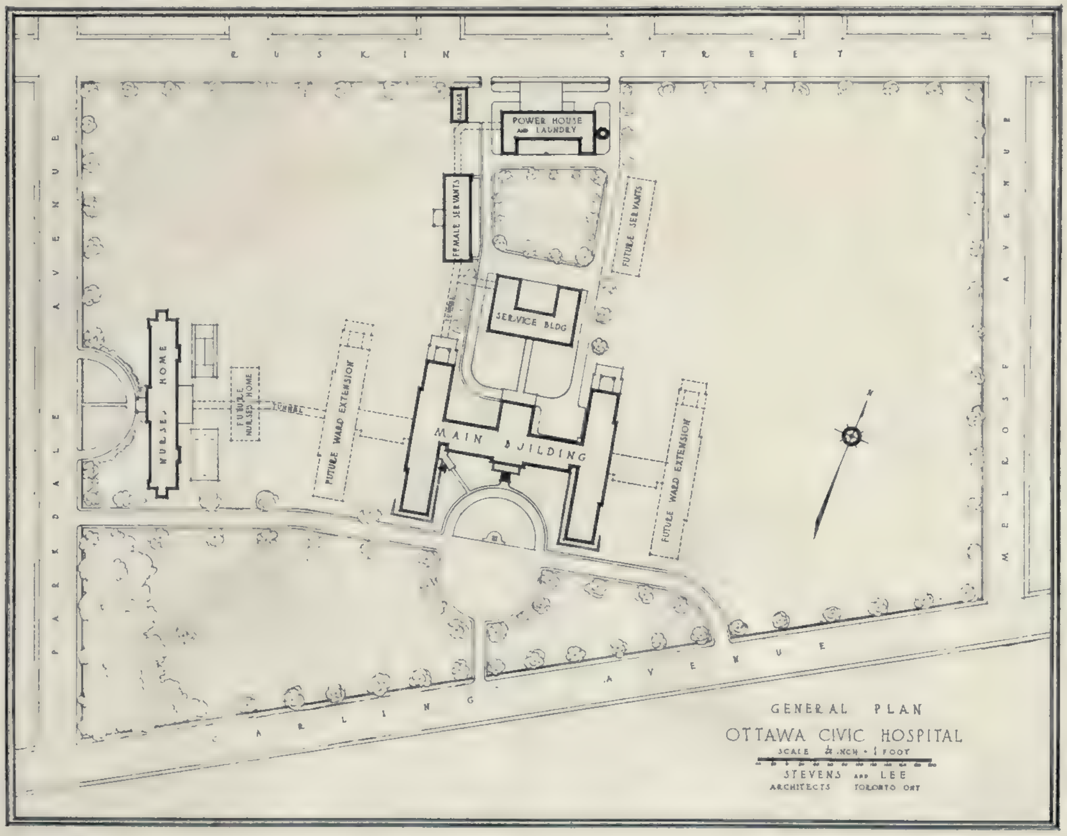


NEW CIVIC HOSPITAL, OTTAWA, NOW IN COURSE OF CONSTRUCTION.

STEVENS AND LEE, ARCHITECTS.

New Ottawa Civic Hospital

THE almalgamation of a number of smaller hospitals in one city and the pooling of interests, as it were, and then building one institution of sufficient size, enlarged equipment, and added facilities for research and diagnostic purposes, are noticeable in Canada's latest large hospital. The Protestant, General, St. Luke's, and the Maternity Hospitals of Ottawa have so gotten together, with the result that a larger and more comprehensive institution is now in process of construction, which is to be known as the Ottawa Civic Hospital.



BLOCK PLAN.

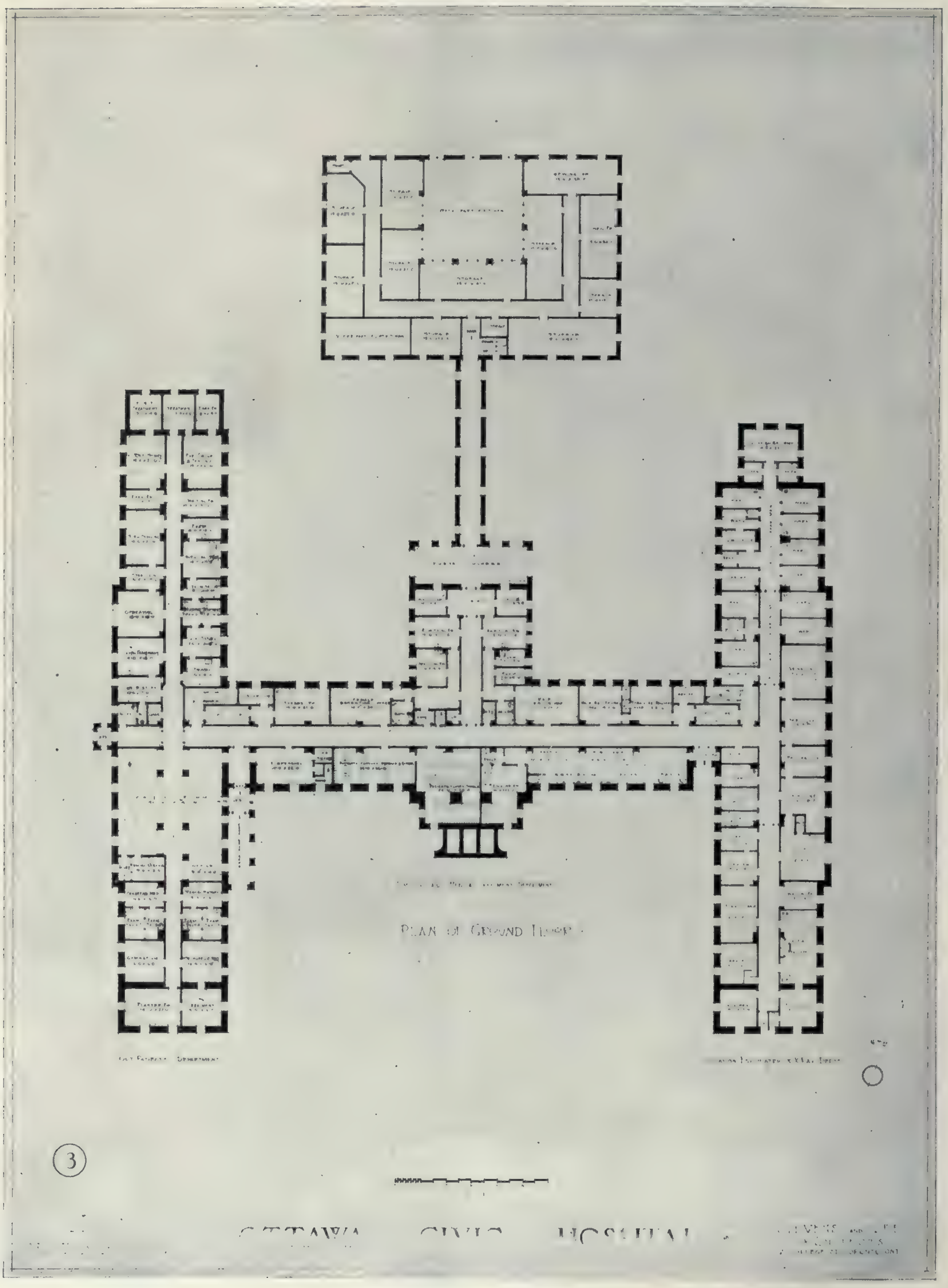
After the appointment of the architects, much time and care were given to the selection of a proper site. One location after another was considered, only to be rejected for one good reason or another; for it was necessary to have enough available land for the future growth of the institution and, at the same time, to have a location which would be available to the medical men as well as to patients and their friends. A site about two miles from the centre of the city, upon the highest land in Ottawa, was finally determined upon. On the south this faces the Dominion Experimental Farm, and on the north has an extended outlook to the Laurentian Mountains in the distance. This site, bought for the purpose of the Hospital, consists of about twenty-four acres of fairly level land, with natural drainage towards the north.

After careful consideration from every standpoint—economy of construction, economy of maintenance, and conservation of human energy—a multi-storied building, housing five hundred patients (the number to be accommodated) was determined upon, with separate buildings for nurses' residence, kitchens, laundry, heating plant, and the housing of domestics.

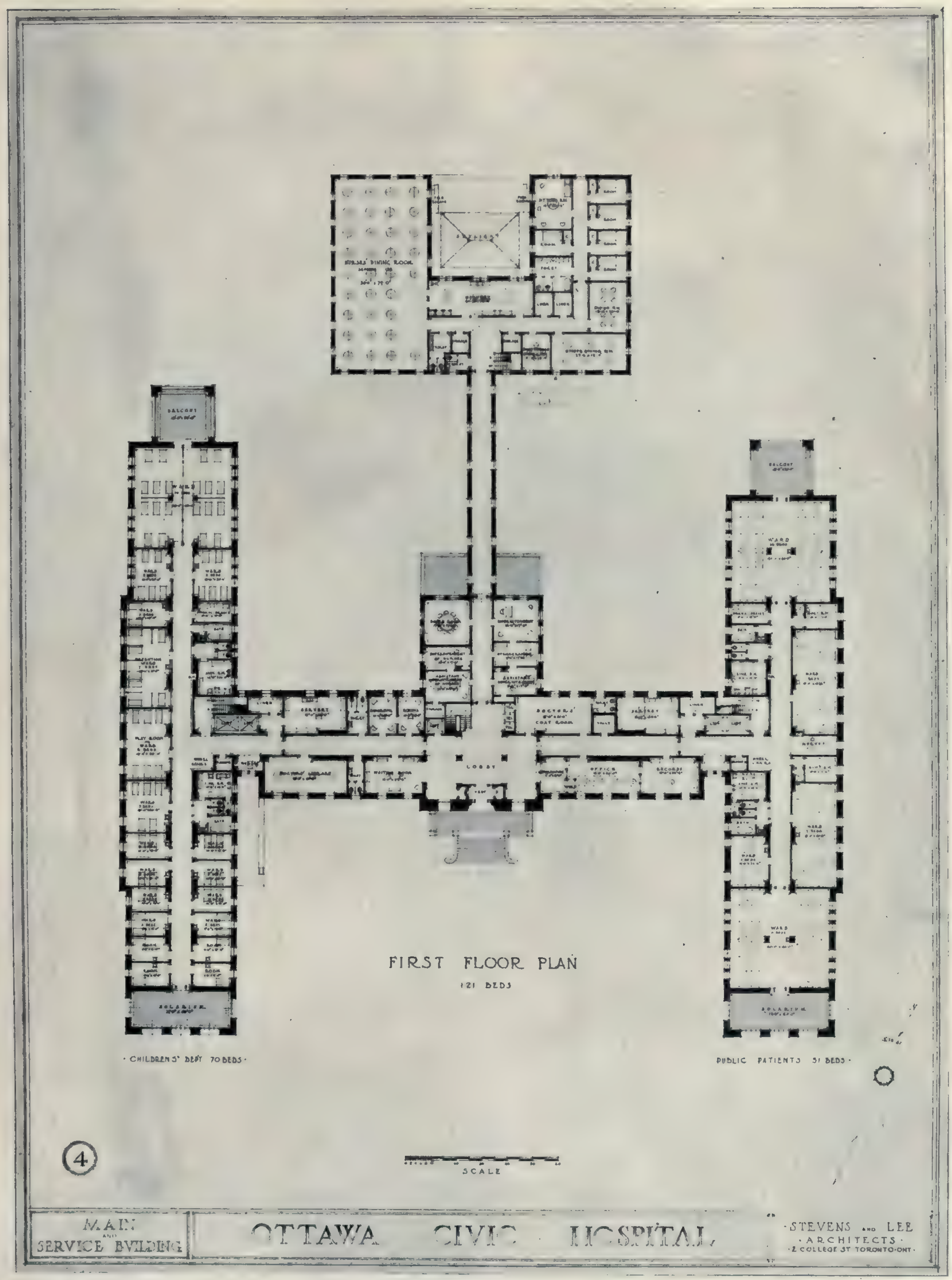
The main Patients' Building is designed in the form of an "H," with the open courts facing north and south. The service portion is located at the crossing of the main corridors, making three distinct units on each floor.

The administrative offices, instead of being located in a separate building, are placed on the first floor of the connecting pavilion and are approached by a drive from Carling avenue. From this first floor level, the dining and other rooms in the Service Building are reached by a connecting corridor which extends over the ambulance entrance, this ambulance entrance being at the ground floor level at the north.

The Out-Patients' Department, with entrance from the front court, is located on the ground floor, and consists of the various sections for surgical and medical treatment. On this floor are located also the X-ray department, the isolation and psychiatric departments, and, at the centre, the admitting department for all patients. This department is reached through an enclosed porte-cochere, and consists of admitting rooms for male and female and a special



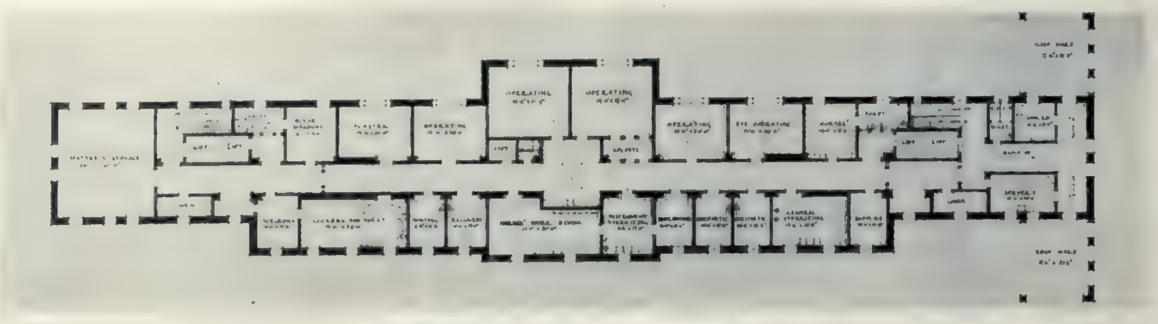
CIVIC HOSPITAL, OTTAWA.
STEVENS & LEE, ARCHITECTS.



CIVIC HOSPITAL, OTTAWA.
STEVENS & LEE, ARCHITECTS.

admitting room for the maternity department, with special lift to the maternity floor.

Both ward and private patients are provided for in this main building, with separations by floors or horizontal divisions. The largest ward is planned for sixteen beds, subdivided on the so-called "Rigs" ward system—that is, with alcoves for four beds each, formed by low screens, affording a greater privacy and decreased danger from the spread of contagion.



OPERATING SUITE: OTTAWA CIVIC HOSPITAL.

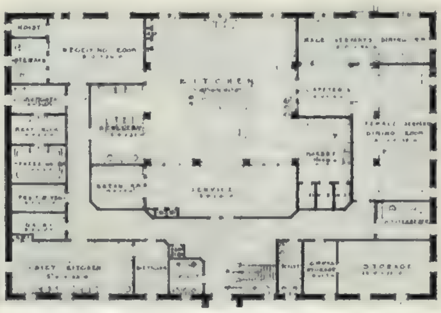
A separate section is set apart for the care of venereal diseases.

There is also provided a children's department, with special baths, playrooms, and airing balconies.

The Maternity Department, consisting of eighty beds, occupies one complete story and has separate delivery rooms and nurseries for the private and ward patients. With the two service units and the lateral subdivisions, the same results of separation and segregation are accomplished as might be obtained in separate pavilions.

One entire floor and a large portion of another floor are devoted to the care of private patients, with single rooms and rooms en suite. All rooms have separate hospital lavatories, and suites of rooms have toilets and baths.

On each floor above the first, there are two solaria and large airing balconies, making it possible for all patients to be in the open air when desired.



SERVICE WING: OTTAWA CIVIC HOSPITAL.

The sixth or top story contains the operating and surgical department, consisting of four major operating rooms, an eye-operating room, and a plaster room, together with service, sterilizing, and work rooms. The natural lighting for operating rooms is by means of high vertical sash, making the cost of maintenance less than if the system of skylights were used, and making possible a simpler and more efficient means of heating.

In the towers are located the ventilating fans; also the plant for distilling the water used for surgical and drinking purposes throughout the building.

In the Service Building, directly north of the main building, are located the main kitchen for the entire group, the storage rooms for all hospital supplies, the dining-rooms for the staff, nurses and servants, and, on the upper floor, the home for the resident staff.

The Power House and Laundry, located to the north of the Service Building and connected by tunnel with the other buildings, contains the high pressure boilers for heating and other services, and the laundry, with rooms for men servants on the top floor.

The Nurses' Residence, located to the west of the main group and facing Parkdale avenue, provides not only single rooms for all the nurses, but also lecture and demonstration rooms, parlors, entertainment and living rooms. Connection to the main group is through an underground passage.

The exterior of the building, as will be noted in the accompanying illustration, is of red brick with stone trimmings, and presents a simple and substantial appearance without undue expense for ornamentation, but of sufficient dignity to conform to the needs of such an important institution.

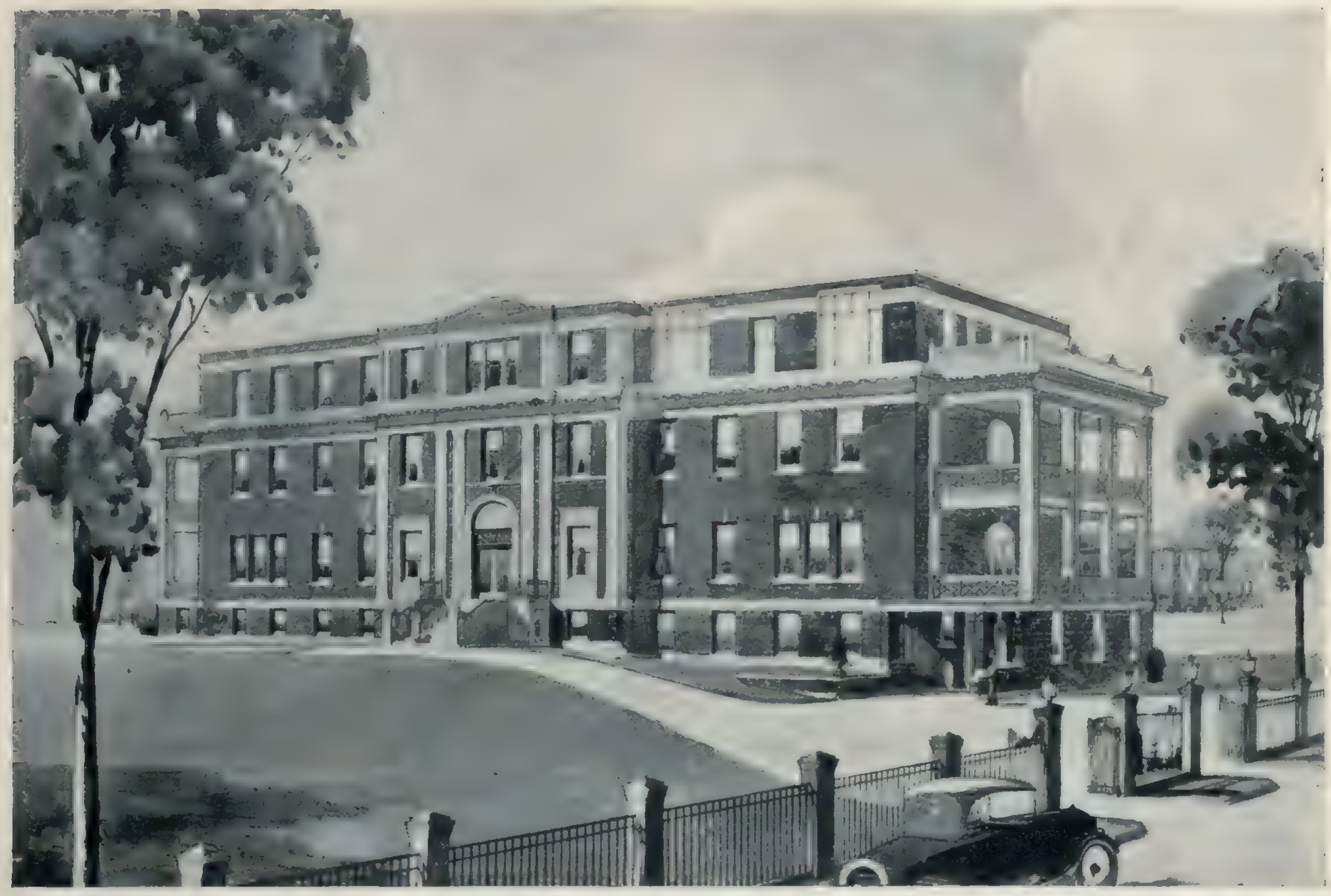
◆

Brandon General Hospital

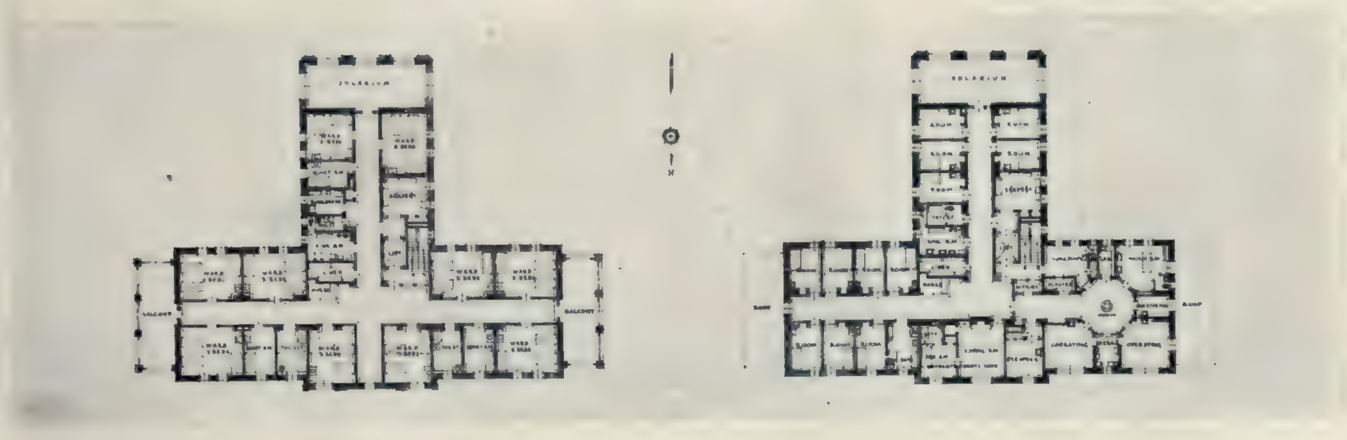
Owing to the inadequacy that has existed for a number of years in the present buildings and equipment of the Brandon General Hospital, it was decided by the Board of Trustees to add a Surgical Pavilion to meet the increased needs of the institution.

As the property on which the present hospital stands was more or less cramped by building, it was decided to build this across the street to the north.

The new surgical pavilion will consist of four

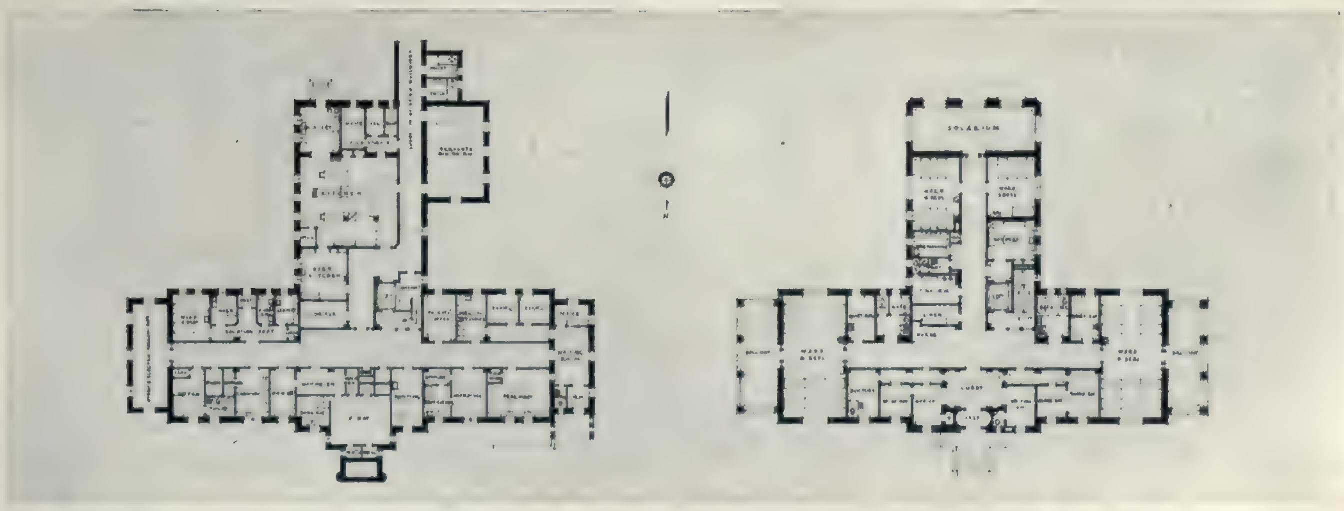


PERSPECTIVE.



SECOND FLOOR.

THIRD FLOOR.



GROUND FLOOR.

FIRST FLOOR.

PROPOSED SURGICAL PAVILLION FOR GENERAL HOSPITAL, BRANDON, MANITOBA.

STEVENS & LEE, ARCHITECTS.

floors, the three upper floors for patients and the ground floor for different services in connection with the whole hospital, that is the kitchens, servants' dining room, admitting and out-patient department, the X-ray and hydrotherapeutic departments and a small isolation unit.

The first floor contains the administrative offices for the whole hospital and accommodation for public patients in small wards from eight beds down.

The second floor contains the rooms for semi-private patients, the average of these being three beds.

On the third floor are single rooms for private patients, the superintendent's rooms and the operating suite.

Each floor is provided with the necessary toilet, sink room and serving accommodation for the care of the patients as well as ample solarium and balcony space.

Food will be served in bulk from the main kitchen by elevator to the different floors as well as back through a tunnel to the older buildings and then by tray service to the different serving rooms.

The heating will be by hot water under forced circulation, steam being brought from the present power house to a point in this building, where will be located the heaters and pumps.

Ventilation will be by means of exhaust flues gathered together in a trunk in the roof space and connected to fans.

The exterior of the building will be of red brick and stone trimmings, only enough of the latter being used to give a sufficiently dignified approach to the whole institution.

Concrete in Alkali Soils and Waters*

A. S. Dawson, M.E.I.C., Chief Engineer, Department of Natural Resources, Canadian Pacific Railway.

THE action of alkali soils and alkali waters on concrete is not a recent development, and is one of extreme importance, not only to engineers and chemists, but to all governments, corporations, and individuals, whose money is being used in the construction of works in districts where certain conditions exist.

The question was studied some fifty years ago by members of an International Association of Testing Materials, on the coasts of France and Algiers. It has been discussed in the United States for some fifteen years by the American Society of Testing Materials, the American Society of Civil Engineers, the Bureau of Standards, and the United States Reclamation Service, as well as by some universities and engineers specializing in concrete work.

In Western Canada the subject is of still more recent birth, and has had the attention of many interested parties since about 1913.

The general effect of these investigations has not been to condemn concrete as a structural material, but in some measure to confine it to its proper field, and to prevent its mis-use. Concrete has been found so generally serviceable and beset with so few disadvantages, that its use has been generally recommended without any reservations.

Actual results have, however, proven conclusively that concrete has its limitations as a structural material, where certain ground and water conditions are known to exist.

In 1918, the subject received considerable attention at a Professional Meeting of the Western Branches of The Engineering Institute of Canada, at Saskatoon; and the writer then presented a paper on behalf of a Committee appointed by the Calgary Branch of The Institute. This paper is also written on behalf of that Committee.

CAUSES OF DISINTEGRATION OF CONCRETE.

The general usual causes of the disintegration of concrete may be summarized as follows:

(1) Bad workmanship.

(2) Poor and unsuitable materials; and badly graded and proportioned mixtures, including the amount of water used.

(3) Alternate wetting and drying out, and alternate freezing and thawing out.

(4) Destruction and removal of the protecting outer skin from various causes.

(5) The presence of an excess of alkali salts.

It is unnecessary to mention the effects of frost before setting, the erosion of the outer skin by excessive velocities and other mechanical agencies, which to a great extent can be provided against during construction and subsequently, by various well known methods.

This paper deals primarily with the effects on concrete of alkali soils and alkali waters.

ORIGIN OF ALKALI SALTS.

First, a brief summary of the origin of alkali salts will be of interest to members who may have forgotten some of their earlier knowledge of chemistry.

---

* Read at the Western Professional Meeting of the Engineering Institute of Canada.

The "Alkalis" as they are called, are carried into the soil with the other elements which form its inorganic bulk by the pulverization of rocks and minerals; by the decomposition of inorganic sediment held in solution by water; by glacial action; seepage from rivers and numerous other sources.

Alkali in the popular sense is a term used to designate the soluble salts that have accumulated in the arid and semi-arid regions. In the humid districts these salts are leached out of the soil, and removed through natural drainage channels.

Oxygen acts on potash, soda, lime, and magnesia; and forms what are known as the "alkali bases."

Oxygen unites with potassium and forms potash.

Oxygen unites with sodium and forms soda.

Oxygen unites with calcium and forms lime.

Oxygen unites with magnesium and forms magnesia.

But—

Oxygen unites with silica and forms silicic acid.

Oxygen unites with carbon and forms carbonic acid.

Oxygen unites with phosphorus and forms phosphoric acid.

Oxygen unites with sulphur and forms sulphuric acid.

These acids, called metallic and mineral acids, have a great affinity for the alkali bases forming "salts"; and this is where the whole trouble with alkali soils begins.

These mineral or metallic acids attack the alkaline bases with the following results:

Silicic acid forms silicate of potash, soda, lime, and magnesia.

Sulphuric acid forms sulphate of potash, soda, lime, and magnesia.

Carbonic acid forms carbonate of potash, soda, lime, and magnesia.

Phosphoric acid forms phosphate of potash, soda, lime, and magnesia.

The salts usually present in greatest amounts in the soils and waters in the middle West, are the sulphates, carbonates, and chlorides of sodium, magnesium, and in a small degree the calciums.

It is the carbonate of soda, or what is commonly called sal-soda which forms what is generally termed "Black Alkali," and the sulphate of soda commonly called "Glauber Salt" which constitutes what is termed "White Alkali." Numerous other salts are of course formed by combining the alkali bases and the mineral acids, but these are not so important in this connection.

When water is brought into the question, the distribution of these salts is largely aided by the fact that the alkalis are extremely soluble in water. When these solutions are brought to the surface evaporation takes place, and an accumulation of alkali salts become evident.

IMPORTANCE OF SULPHATES AND CHLORIDES.

Chemists have as yet been unable to agree on the determination of the exact reactions which are the cause of the disintegration of concrete; but investigation has shown that the sulphates and chlorides appear to be by far the most active salts found—and it is generally now admitted that magnesium sulphate, magnesium chloride and sodium sulphate are the most active salts found in alkali soils and waters.

The magnesium sulphate acts on the calcium hydrate of the cement, forming calcium sulphate, and the latter combines with the alumina of the cement, forming calcium sulpho-aluminate, whose crystallization gives rise to swelling and cracking in the material, and a corresponding destruction of all cohesion. Similarly, sodium sulphate combines with the calcium hydroxide of the cement, forming soluble sodium hydroxide. This also brings up the question of the difference in the susceptibility of various cements to these destructive agencies.

ACTION OF GROUND WATER.

It has been determined by several chemists that the action of the ground water seems to be a chemical change—converting the lime of the cement into a sulphate and carbonate; accompanied by the removal of silicic acid, alumina, and lime, and totally destroying the cohesiveness of the concrete.

The formation of sulphates of lime and aluminates of lime, results in an immense increase of volume, and a corresponding total destruction of all cohesion.

To offset this, the magnesium hydrate may have a tendency to fill the pores of the concrete; and in this and other ways, may gradually become more impervious—thus checking somewhat the disintegrating effects.

A working theory generally now accepted, is as follows:

The chemical reaction of alkali that is destructive to cement work is a double decomposition between the various alkali salts and calcium hydroxide, the latter being an unavoidable constituent and probably the binding constituent of all set cement, whether the cement is classed as "Portland," "Natural," or "Slag." This reaction removes a greater or less amount of the calcium hydroxide, the amount depending upon the salts present, the concentration of the solution, the rate of percolation and imperviousness of the cement, and the solubility of the reaction products; and deposits in its place, in most cases, a molecularly equivalent amount of other compounds, which have good cementing properties but occupy more space than the calcium hydroxide, This increase of space occupied disrupts the cement, causing it to bulge, crack, and crumble.

ANALYSIS OF ALKALI ACTION.

The following conclusions are now generally accepted:

I. The disintegration of cement by alkali salts is principally due to reactions between these salts and the calcium hydroxide necessarily present in set cement.

As a result of these reactions, relatively insoluble new compounds are formed in the body of the cement structures.

It has been shown that these new compounds have greater weight and require greater space than the calcium hydroxide replaced.

In order to obtain the necessary space the new compounds force apart the particles of the cement, thus weakening or breaking the binding material.

1. The compounds resulting from these reactions with the various destructive salts are as follows:

a. With sodium sulphate the resulting compounds are sodium hydroxide, which is soluble and therefore is removed by leaching; and gypsum, which is realtively insoluble and therefore accumulates in place of the calcium hydroxide.

b. With magnesium sulphate the resulting compounds are magnesium hydroxide and gypsum, both of which are insoluble and accumulate in place of the calcium hydroxide.

c. With sodium carbonate the soluble sodium hydroxide and the insoluble calcium carbonate are formed. In this case there is little increase in the space required, but the silicates and aluminates are also attacked and dissolved. This solvent action is especially marked upon the silica. This loss of silica must weaken the cement; but there is little, if any, crumbling due to expansion.

2. The additional material, requiring increased space, consists in part of dry matter and in part of combined water, which is taken up by the cement during its exposure to the alkali solutions.

a. This increase in dry matter is brought about by the formation of the sulphates, magnesium hydroxide, and carbonates, as shown by the reaction given in paragraph 1, a, b, and c.

b. Part of this increased amount of combined water is due to the fact that the new compounds, gypsum, magnesium, hydroxide, etc., require more water for crystallization than did the calcium hydroxide which they replaced. This further assists in the disruption of the cement.

c. A part of this increased amount of combined water is due merely to the continued action of water upon the incompletely hydrated cement. This amount should serve to set free more calcium hydroxide, and thus to a certain extent repair the damage due to loss of binding material and to expansion.

II. A certain weakening, not a disruption of the cement, is due to the loss of a portion of the binding material, crystallized calcium hydroxide, which is merely dissolved and removed in solution.

III. In order for destructive action to become marked, the alkali solutions must percolate through the cement work, or at least must penetrate beyond the surface.

IV. When the action is strictly confined to the surface, as when briquettes of neat cement are immersed in a still solution, the tensile strength may be increased. In such cases the expansive action closes up the pores, making thesurface more nearly impervious and preventing the alkali from penetrating further.

V. When cracks are started by the expansive action, due to alkali salts; wetting and drying, or freezing and thawing, will hasten the destruction of the cement, by extending the cracks already started.

PREVENTIVE MEASURES.

VI. Any measures that hinder the penetration of the alkali solutions into the interior of the cement will delay the destructive action. For this purpose both soap and aluminum sulphate have been tried, and have been found to afford some protection. The soap, however, in itself had a slightly injurious effect on the tensile strength of the cement.

The efficiency of these and of other waterproofings is being further studied, and results may be expected later.

The mixing of cement in weak solutions of sulphuric acid, di-sodium phosphate, magnesium fluoride, and oxalic acid has been shown by laboratory tests to increase the alkali-resisting qualities of concrete. The effects of most of the alkalis have also been shown to be less pronounced on neat cement briquettes than on sand cement briquettes, and in fact somewhat proportional to the amount of sand used.

CONDITIONS FOUND IN PRACTICE.

In practice, the worst conditions are generally found on types of structures whose design has nesessitated their being backfilled on one side, and subjected to ground water from the same direction—and at or below the original ground surface. These conditions seem to be aggravated where the structures are subjected to dry and wet surroundings—exposed to sun and shade during the winter months—and where alkali salts are most in evidence, and the ground wet. The facts that the deterioration starts on the surface extending inwards, and that the water being carried by the structures has analytically been shown not to be responsible for the trouble, would indicate that the deterioration was primarily caused by the ground water and its effects on the concrete. These effects vary in a degree from the surface spalling off in what results in a pile of loose gravel below—to a condition where the mass becomes of a slimy consistency, like so much lime mortar, and mud. As a rule samples in what might be termed an intermediate stage get harder if permitted to dry out in the air—when they become coated with white powdery salts.

Either the disintegration is due to soluble compounds which are leached out of the concrete leaving it inert, or it is due to the disruption caused by the crystallization of the salts in the pores, or by chemical action of the substances in solution with the constituents of the concrete.

Any conditions which will tend to carry the salts from the soil, to the concrete, will hasten the disintegration action and lessen the percent. of alkali necessary to cause destruction.

A volume could be written on the chemical phases of this subject, and it would all be interesting; but as previously stated, this paper deals primarily with the experimental work done to date by a Committee of the Calgary Branch of The Institute.

EXPERIMENTAL WORK BY THE CONCRETE COMMITTEE.

In October, 1918, 270 concrete blocks and 180 cylinders were made at Calgary, under close supervision.

These blocks were moulded in wooden gang moulds, 10 inches x 10 inches x 30 inches long, and the cylinders in steel moulds, 8 inches in diameter and 16 inches long. Two hundred and sixteen blocks were made, using Western cement, and 54 from Owen Sound cement. All were carefully marked for identification purposes.

All materials used were analyzed physically and chemically.

The gravel was from what is known locally as the Carseland Pit, a well graded, bank-run material. The water was from a City of Calgary main. Samples of soil and ground water were procured from each hole in which a specimen was placed.

The blocks were made in three series.

(A) Screened, sized and washed. The sand was supposed to grade uniformly from fine to coarse—not to exceed 40 per cent. by weight, passing a No. 30 screen, and not more than 30 per cent. by weight, passing a No. 100 screen; and the voids were not to exceed 35 per cent.

The gravel was supposed to be uniformly graded in sizes from ¼ inch to 2 inches in diameter, and the voids not to exceed 40 per cent.

(B) Bank run material, washed.

Bank run material unwashed.

Each series of blocks were made in two mixes.

First, 1 — 2 — 4.

Second, 1 — 1½ — 3.

Of each mix, three blocks were plain.

Three were treated with two coats of soap and alum.

¾ lb. of castile soap, per gallon of water, heated to 180 deg. F.

2 oz. of alum to one gallon of water, heated to 100 deg. F.

1 coat of hot alum solution.

1 coat of hot soap solution.

1 coat of hot alum solution, after 24 hrs., all well brushed in.

Three were treated with water gas tar and coal gas tar as follows:

First coat, refined water gas tar of thin consistency.

Second coat, same, and immediately after the first.

Third coat, refined coal gas tar, applied hot, after coats one and two, were well soaked in.

Fourth coat, same as third, after third coat set.

The blocks were taken from the moulds in 48 hours and cured for 28 days, after which they were placed in the ground 22 inches, with 8 inches exposed, at the following points:

(1) On top of a high hill in Calgary, where no alkali conditions were likely to exist, and where there would be no ground water in contact with them.

(2) Near a sewer, in a low lying plot of ground, in Burns-land, Calgary, generally wet, and where alkali conditions had given evidence of being bad.

(3) At Strathmore, in a low lying plot, once a slough, where alkali conditions seemed bad, and where they would probably be wet most of the time.

(4) Near Brooks, in a low lying place, where the alkali conditions were apparently very bad, and where they would be wet most of the time from seepage water from an irrigation ditch.

The cylinders which were all made of Western cement, were buried at the foreging points, and 62 were placed in the Calgary City Hall Laboratory.

CONCLUSIONS TO DATE.

1st. Laboratory test cylinders are all relatively lower in strength than field tests because of the difficulty of maintaining a uniform degree of moisture.

2nd. The blocks and cylinders located in the Calgary district show no disintegration as yet because of the fact that the ground conditions were relatively much dryer than normal.

3rd. The blocks at Cassils show a much greater disintegration than those at other locations because of the greater concentration of soil solutions. Those of Strathmore show the next greatest degree of disintegration, because of less concentration of soil solutions and possible drying out at certain seasons.

4th. In a concrete of high density, where absorption of the alkali ground water appears to be mainly at the surface of the concrete, the action appears to be relatively slow and is largely in the nature of surface action, gradually extending to the interior.

In a concrete of low density and relatively high porosity the action is more rapid as it appears to take place simultaneously throughout the structure.

The more porous concrete is subject to the action of other disintegrating forces of a physical nature, such as frost action and the crystallization of salts in the pore space.

A dense concrete mixture, through some property not determined, such as low percentage of pore space or the character of this pore space, results in a greater resistance to the action of the alkali ground waters. Apparently this is true in either mixture 1 — 1½ — 3 or 1 — 2 — 4. Chemical action takes place over relatively small distances, direct contact of the reacting elements being necessary. The more porous concrete allows this more intimate contact throughout the structure; and consequently more rapid action takes place.

5th. The presence of alkali soil solutions does not retard the setting of the cement.

6th. The action is undoubtedly more rapid in weaker mixtures and mixtures of low density.

7th. No apparent difference in results was found in blocks and cylinders made of Eastern and Western cements.

CONTINUATION OF EXPERIMENTS.

The investigations are being continued in several lines that may give further information.

Blocks after approximately twenty months' curing in the Calgary district on which no alkali action has as yet become apparent, have been transferred to the Cassils location, and action of alkalis will be noted.

New blocks and cylinders are being prepared from gunite, and these after curing will be placed in the Cassils location and action noted.

Some tests are being made on waterproofing compounds at the present time.

The important practical phase of this matter is to have further investigation work carried on by competent chemists and engineers, working in close co-operation with one another; and in the meantime for all those concerned, to make use of the existing data, and take all possible precautions and remedial measures to prevent further deterioration to the existing works. In this connection the following points should be noted:

DESIRABLE FEATURES FOR CONCRETE IN ALKALI SOILS.

(1) Efforts should be made to get the densest possible mixture, and in this connection the smallest quantity of water consistent to good work should be used; in other words, a quaking mixture should be made of a workable mix, *i.e.*, to a consistency that will permit of the concrete flowing around the reinforcement with thorough pudding, and not so as to cause the finer particles to be carried to the top in suspension and the heavier ones to settle. About one gallon of water to each cubic foot of concrete in place is a fair average for a good mix.

(2) The best possible materials procurable should be used—and the best graded mixtures. All bank run material or river gravel should be screened out and remixed in proper proportions —based on proper tests made as to voids.

(3) It is desirable that all material should be washed, and it is almost essential that the sand should be washed; and in this connection it would be folly to assume that sands can be properly selected and passed on, without proper tests having been made on them.

(4) More care should be exercised in making field joints, using ½ inch of 1 to 2 grout on the junctions between the old and new work.

(5) Where chutes are used, they should be on easy slopes and kept down to the shortest possible length.

(6) The time of mixing is an important factor, and it is now generally conceded that the best results are obtained from machine mixing for a period of about 1½ to 2 minutes continuous revolving of the mixing drum.

(7) Backfilling with sand and gravel with the coarser material next to walls and plenty of weep holes are all extremely desirable, and particularly on such types of structures as have been previously mentioned, and are more easily subjected to alkali conditions.

(8) Closer supervision of all work done, by men who really *know* the concrete business is essential.

(9) Proper seasoning and protection from the elements, and not too early removal of the forms. It is important to remember that the methods and operations adopted in mixing concrete, are just as important factors affecting its density, strength and permanence, as are the qualities of the materials used.

(10) The use of gunite and gun driven asphalt at normal temperature or heated are being

tried out, and are both likely to prove effective methods—not only of damp-proofing and waterproofing, but of preventing the ill effects of alkali salts on concrete structures.

Extract from "Lime and Cements," second edition by Ernest A. Dancaster, B.Sc., A.I.C., London, Eng., 1920.

SUPER-CEMENT.

"A variety of Portland cement was introduced by Mr. J. F. Goddard in 1915 under the name of Super-cement. This cement is manufactured from Portland cement clinker by grinding in with it treated gypsum instead of the ordinary gypsum used for regulating the setting time. Super-cement was originally intended to be a waterproof Portland cement, that is to say, an ordinary Portland cement to which material was added in order to render it waterproof, thus obviating the disadvantage of having to entrust the mixing of the waterproofing compounds to possibly careless or ignorant workmen. It was soon found, however, that the cement prepared in this manner not only produced a waterproof mortar, but the latter was also much stronger than ordinary Portland cement mortar, thus differing from the usual waterproofing materials, which tend to weaken the cement with which they are used. The increase in strength is specially marked in the case of cement and sand mortar, and the difference increases with time. This cement requires more water to produce a paste of 'normal' consistency than does ordinary Portland cement, and the mortar is both denser and harder. It is too soon to say definitely in what manner this addition of the treated gypsum acts upon the cement, but it certainly is neither a mere water repellent nor a pore filler. The main effect appears to be to bring about a more complete hydration of the cement particles. A number of tests with this cement have been carried out by the author, and also by others, and it has been found that the same clinker invariably yields a stronger cement when ground with the treated gypsum than it does when ground in the ordinary way.

The following tensile and crushing results were obtained by Messrs. David Kirkaldy & Son. Both the Portland cement and the Super-cement were made from the clinker, but the former was ground with ordinary gypsum and the latter with the treated material.

SUMMARY OF TESTS.

Tensile Strength.

ORDINARY CEMENT.

Neat cement.	3 parts standard sand, 1 part cement.
Gauged with 23% water.	Gauged with 9% water.
Age 7 days..660 lbs.	Age 7 days..371 lbs.
" 28 " ..843 "	" 28 " ..425 "
" 90 " ..806 "	" 90 " ..453 "
" 3 mos...872 "	" 6 mos...845 "

SUPER-CEMENT.

Age 7 days..746 lbs.	Age 7 days..408 lbs.
" 28 " ..865 "	" 28 " ..471 "
" 90 " ..899 "	" 90 " ..501 "
" 6 mos...894 "	" 6 mos...511 "

Crushing Strength.

Ordinary cement. 1 and 3.	Super-cement. 1 and 3.
Age 7 days..3260 lbs.	Age 7 days..4030 lbs.
" 28 " ..4470 "	" 28 " ..5400 "
" 90 " ..5080 "	" 90 " ..6320 "
" 6 mos...6580 "	" 6 mos...7500 "

"The tensile tests given below were carried out by the author.

Tensile Strength.

ORDINARY PORTLAND CEMENT.

Neat cement.	3 parts standard sand, 1 part cement.
Gauged with 25% water	Gauged with 10% water
Age 7 days..592 lbs.	Age 7 days..263 lbs.
" 28 " ..661 "	" 28 " ..314 "
" 90 " ..698 "	" 90 " ..343 "

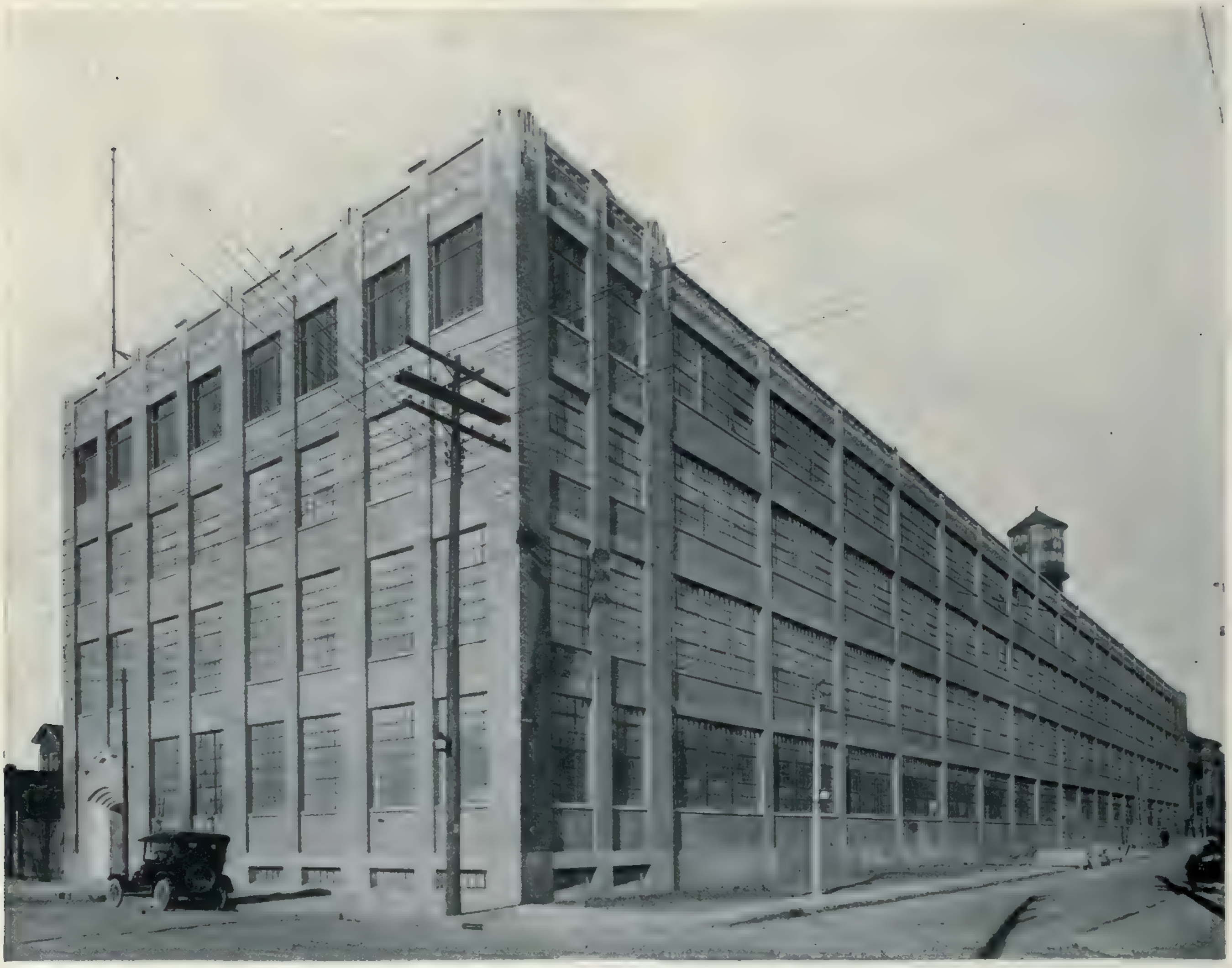
SUPER-CEMENT.

Age 7 days..703 lbs.	Age 7 days..398 lbs.
" 28 " ..776 "	" 28 " ..426 "
" 90 " ..814 "	" 90 " ..457 "

"This cement may truly be described as a waterproof cement. It is found that a slab one inch thick, made of a mortar composed of one part by weight of super-cement to one part of washed sand, will keep back water under a pressure of over 300 lbs. per square inch. The cement is also petrol proof, a similar slab having been found to keep back petrol under a pressure of 50 lbs. per square inch for 67 days. At the end of this period the test was stopped and the slab broken, when it was found that no penetration had taken place. Advantage has already been taken of this property, a number of storage tanks for petrol having been built with super-cement reinforced concrete at various aerodromes. It is probable that when this material becomes more widely known it will be not only universally used wherever waterproof cement work is required, but also in ordinary work where a high quality of reinforced concrete is desired."

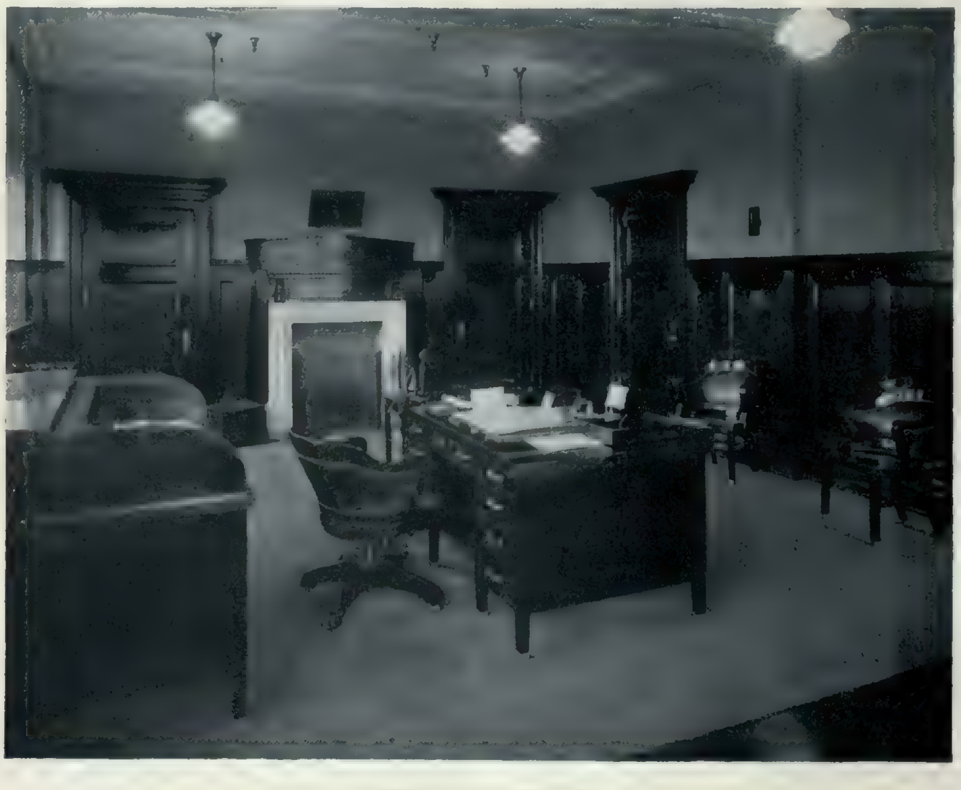
It is not the purpose of this paper to attempt to discourage in any way the rapidly growing use of cement in its manifold forms of application, but rather with the belief that "forewarned is forearmed" by calling attention to the dangers which exist, and the necessity of taking all possible steps to avert trouble and financial loss.

The whole question serves as an illustration of the inter-relation of chemistry and engineering which exists on many of the public works being carried on at the present date.



GENERAL EXTERIOR VIEW.

NEW FACTORY AND OFFICE ADDITION OF THE DUNLOP TIRE & RUBBER GOODS COMPANY, TORONTO.



BERNARD H. PRACK, ARCHITECT AND ENGINEER.

GENERAL MANAGER'S OFFICE.

Dunlop Tire & Rubber Goods Co. Addition

THE new four-storey reinforced concrete factory and office building of the Dunlop Tire & Rubber Goods Company, Limited, Toronto, which was opened on September 15th, marks the completion of a very attractive and substantial addition to the company's plant. Together with the present plant, it provides sufficient space for immediate needs, as well as permitting extensions to the west along Queen Street and the addition of a fifth storey when required.

The new building is 82 ft. 6 in. in width, 402 ft. 6 in. in length, comprising four storeys in height, the first storey being 15 ft. in height, the second 14 ft. and the third and fourth, 13 ft.

At the Queen Street end is a basement which is in the form of a tee, with a head towards Queen Street and the full width of the building and the arm extending back two centre bays in width and eight bays in length. The remaining portion of the first floor is without a basement, for the reason that the heavy equipment, which requires enormous foundations, could not be carried economically on a slab construction.

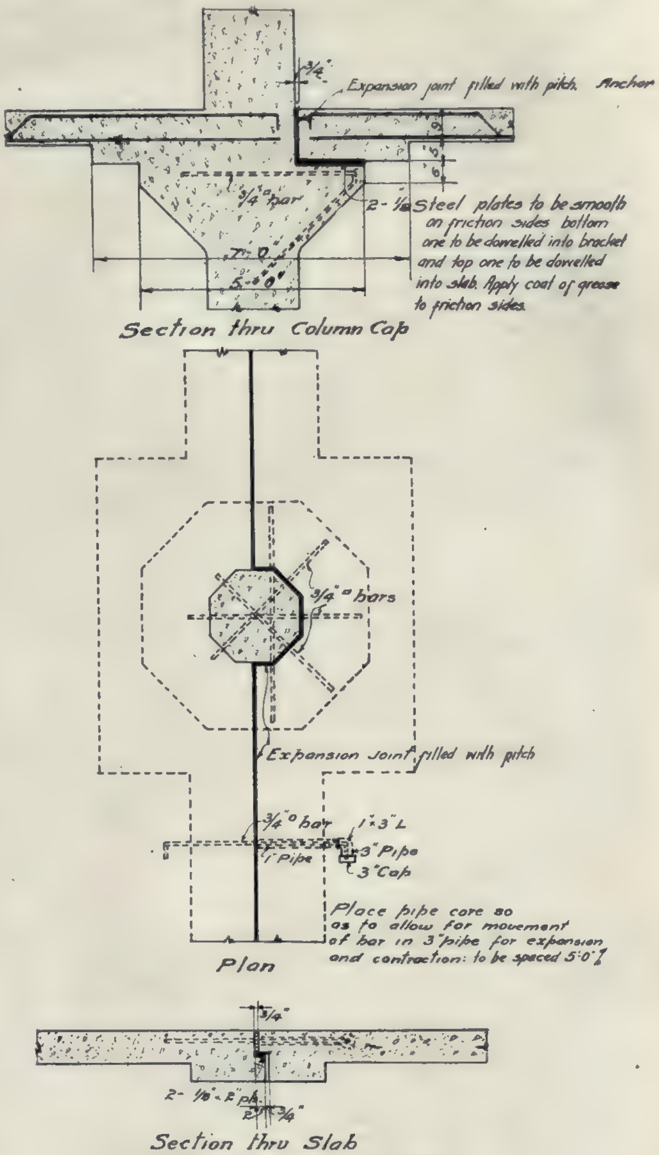
All of the floors throughout are of flat slab construction, employing the four-way system of reinforcement, and are designed for a live load of 250 pounds per square foot.

The general layout of the building was an important point, so as to get elevator facilities at the proper location and other communications such as stairs, chutes and other connections from floor to floor. The particular type of construction as well as the general arrangement of the building permits the spacing of the columns 20 ft. centres each way throughout. The floors throughout the building was another point which required a great deal of consideration, due to the fact that in certain places the heat in the building is at a high temperature and the wear and usage of the floor in many cases is heavy.

After considering the various floor variations, it was considered advisable to lay a creolite wood grooved block floor throughout the building where the highest temperatures are to be maintained and where the floors would receive the heaviest use and trucking. Throughout the tire building departments a mastic floor was installed, and throughout the warehouse and storage space a concrete finished floor was installed.

In treating the architectural design of the building, the function of the building was kept in mind, the usage of the building requiring much light and ventilation. No efforts were made to hide the features of a factory or the structural features, but mainly to secure a pleasing combination.

In providing for the future extension of a wing extending west along Queen Street, two courses were open with this type of construction, one to provide brackets on the columns to carry the future floor and the other a continuous ledge.


3/4"
Expansion joint filled with pitch. Anchor
9
5
6
3/4" ⌀ bar
2 - 1/2" Steel plates to be smooth on friction sides bottom one to be dowelled into bracket and top one to be dowelled into slab. Apply coat of grease to friction sides.
7'-0"
5'-0"
Section thru Column Cap
3/4" ⌀ bars
Expansion Joint filled with pitch
3/4" ⌀ bar
1"×3" L
1" Pipe
3" Pipe
3" Cap
Place pipe core so as to allow for movement of bar in 3" pipe for expansion and contraction: to be spaced 5'-0" ⌀
Plan
3/4"
2 - 1/8" × 2" pls.
2"
3/4"
Section thru Slab

DETAIL OF EXPANSION JOINT.

Taking into consideration the profile of the wall and the probable length of time before the new extension would be added, and the prominent position to eastbound traffic on Queen Street, a decision was made in favor of the continuous ledge, which is cast on the spandrel beam from column to column on the lower edge of the beam and was designed to carry the future slab, haunched directly on it without the addition of any beams, and at the same time presenting no abrupt break to the eye. To bond the future extension to the present building, the direct transverse reinforcement was allowed to extend beyond the wall line.

TYPICAL FACTORY FLOOR.

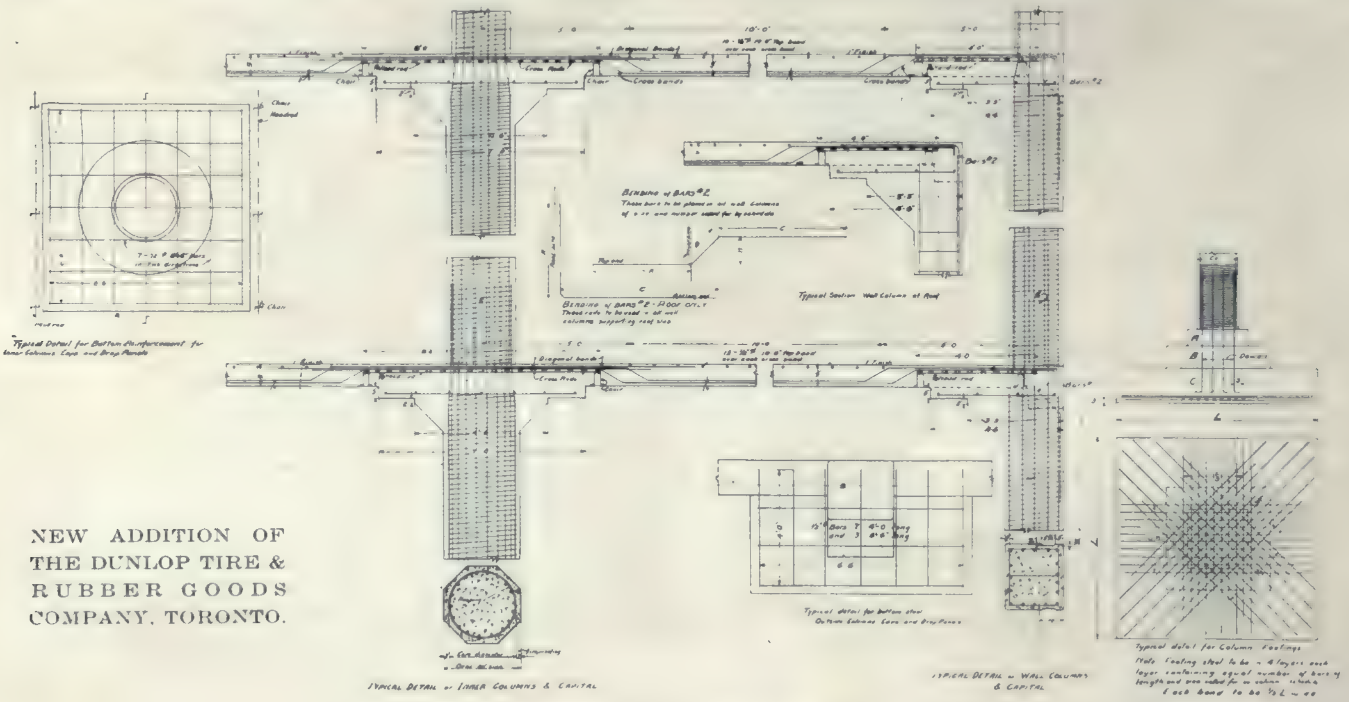
The arrangement of the building is quite a unique feature as regards up-to-date tire factory design, the basement being utilized for the storage of heavy cores, etc., and to provide for the hydraulic ram of the vulcanizers. The vulcanizers extend from the basement to the second floor and are located at the south end of the building.

The main office entrance is located on the south-west corner, with elevators and stairs running to the upper floors. At the rear end of the first floor will be the employment entrance, and the large floor space at this end of the building will be occupied by calendar and mill lines.

The second floor of the building is given over to the tire-building machines and the space of the vulcanizers; the third storey is largely utilized for stock-rooms, and the entire fourth floor is occupied by the general offices, which include the executive offices as well as a cafeteria and kitchen.

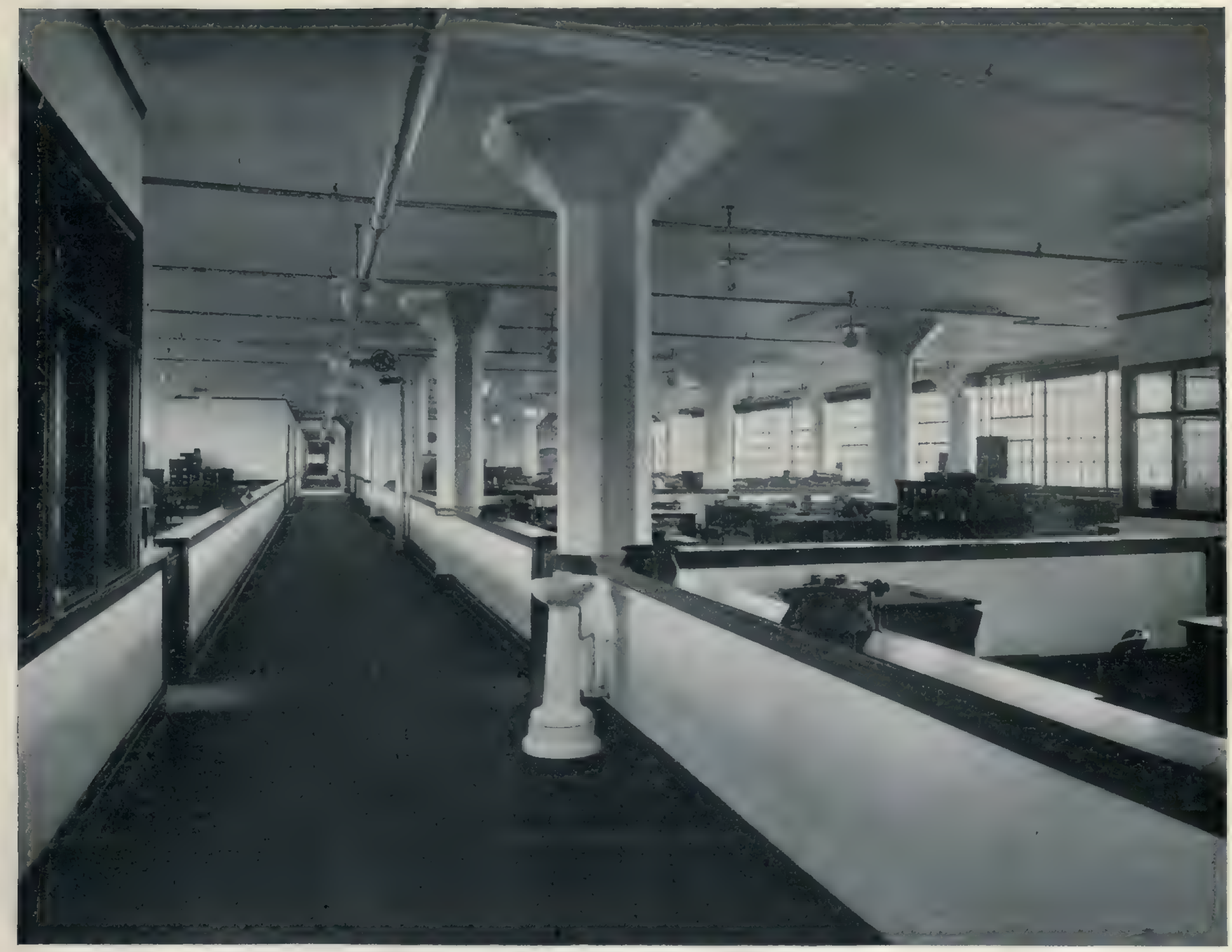
The various temperatures incidental to certain phases of the rubber industry, the variation of Toronto weather and the length of the building made it necessary to provide for expansion and contraction. The expansion and contraction joint consists of two parallel beams of the same depth as the drop panel, one fixed to the column and the other free.

To provide a suitable surface for movement, two contact plates were fixed in place, the upper one being dowelled to the bottom of the free beam and the lower to the bracket, with the contact surfaces polished and greased. Between the columns a 2 in. bracket was cast, with the beams and narrow plates attached. This bracket does not provide for bearing, but to prevent water and pitch penetrating to the ceiling below.


10'-0"
Diagonal bands
Cross Rods
Chair
Cross bands
Bars #2
Chair
Headrod
Typical Detail for Bottom Reinforcement for Inner Columns Caps and Drop Panels
Bending of Bars #2
These bars to be placed in all wall columns
Typical Section Wall Column at Roof
Bending of Bars #2 - Roof only
These rods to be used in all wall columns supporting roof slab
Diagonal bands
Cross Rods
Chair
A
B
C
Dowels
L
Typical detail for bottom steel Outside Columns Caps and Drop Panels
Typical Detail of Inner Columns & Capital
Typical Detail of Wall Columns & Capital
Typical detail for Column Footings
Note Footing steel to be in 4 layers each layer containing equal number of bars of length and size called for in column schedule
Each band to be ⅓ L wide

NEW ADDITION OF THE DUNLOP TIRE & RUBBER GOODS COMPANY, TORONTO.

TYPICAL DETAIL OF WALL AND INNER COLUMNS.



VIEW OF FOURTH FLOOR SHOWING GENERAL OFFICES.

NEW ADDITION OF DUNLOP TIRE AND RUBBER GOODS COMPANY, TORONTO.

At the time of pouring the concrete, a joint of three-quarter inch was provided, which was filled with pitch to the bracket, but open from the bracket to ceiling.

The treatment in the wall columns is similar to the centre, except that, owing to the steel sash, it was not possible to provide a bracket for the spandrel beam, and bearing had to be taken care of by a six-inch slot in the column, with plates fixed as in the previous cases.

In order that the building might not be entirely separated, dowels were placed, fixing same in the concrete on the one side of the expansion joint and placing them in a gas pipe on the other side, which would permit a movement of three inches before the dowel would begin to act.

The building is equipped with the most modern and up-to-date mechanical equipments as regards plumbing, heating, sprinkler and electrical wiring for both light and power.

Electrical energy is used throughout as the power driving the rubber mills, calenders, tire-building, etc., there being some 2,000 h.p. used. The larger motors are fed by lead cables direct from the sub-station at 2,200 volts, while the smaller motors are fed by a 550-volt distribution system controlled by a seven-panel main switchboard centrally located in the building.

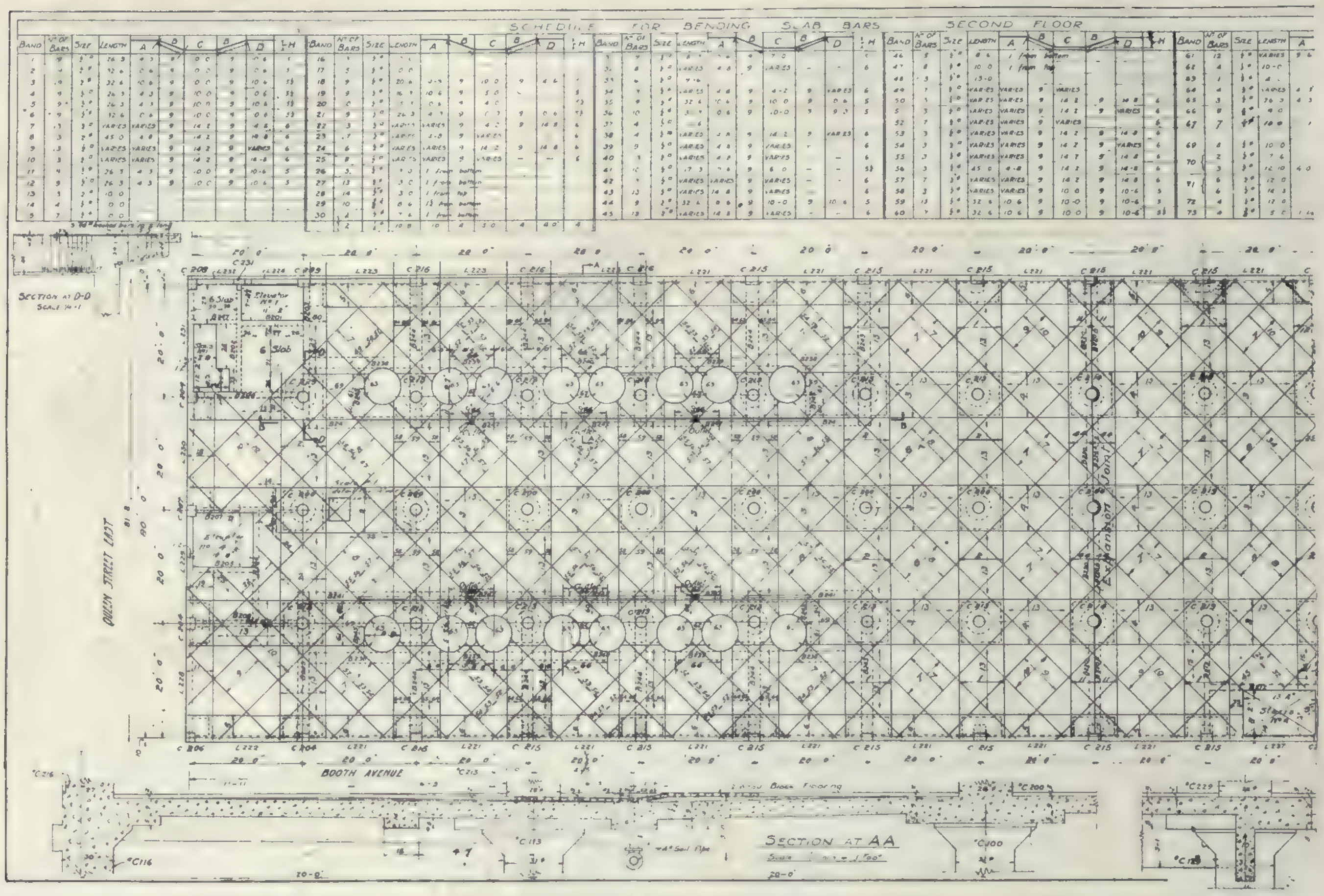
A considerable amount of direct current is used in these machines, requiring much variation in speed. The lighting system consists of five sub-feeders, running from the first floor to the top, each feeding a distribution panel on the respective floors.

The lighting panels are all of three-phase construction, and the lighting load is thus practically balanced on the three phases of a 2,000-volt line, feeding the lighting transformers located in a vault on the ground floor.

◆

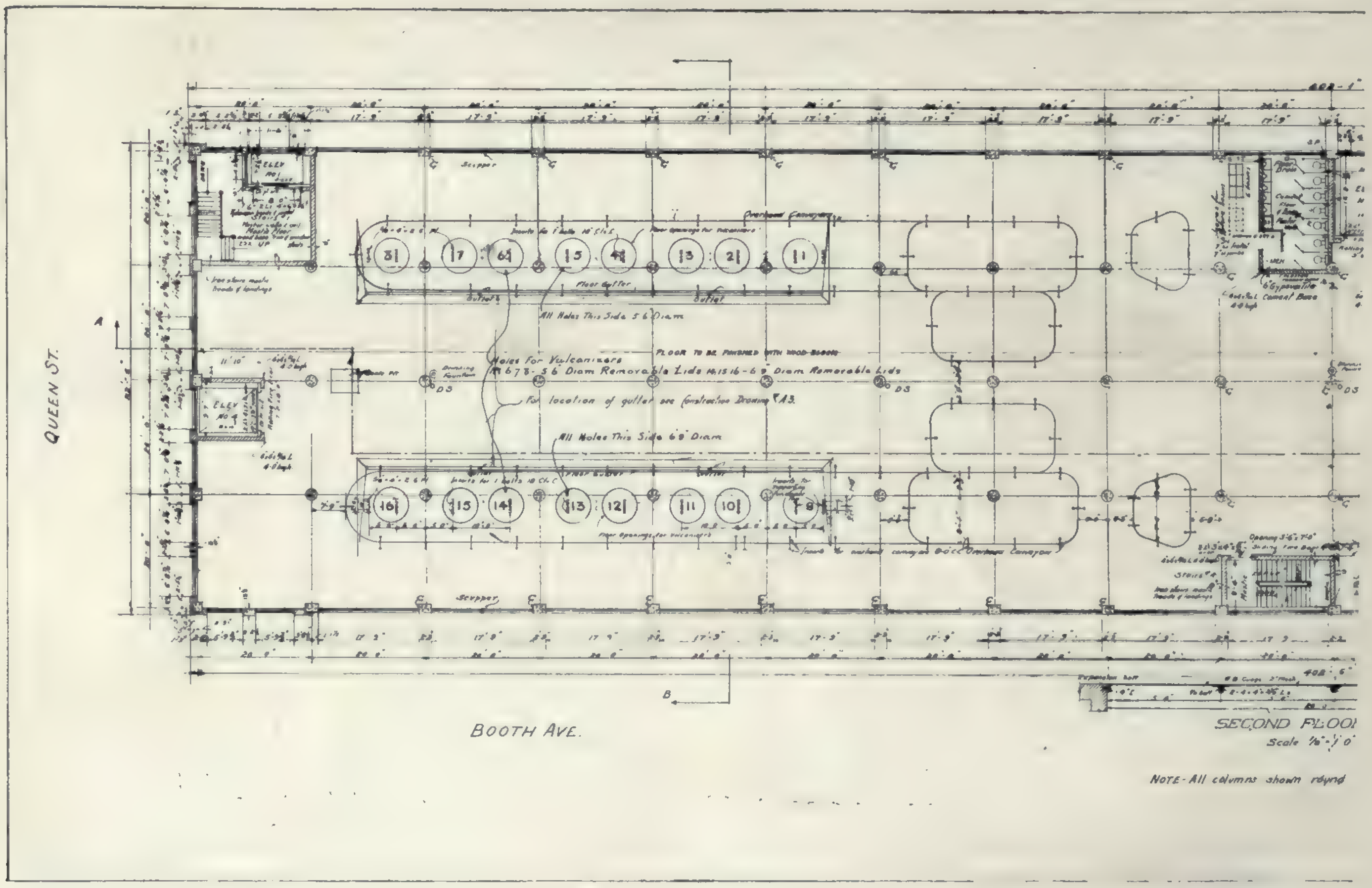
P. Q. A. A. Annual Meeting

The Province of Quebec Association of Architects will hold their annual meeting in the rooms of the association, 590 Union Avenue, Montreal, at 9 a.m., January 15th, next. Examination of candidates for membership and registration will be held on January 24th, on or before which date proofs of qualification must be submitted to the association by those who are seeking to take up practice in the profession.



SECOND FLOOR FRAMING FLAN.

(Continued on opposite page.)

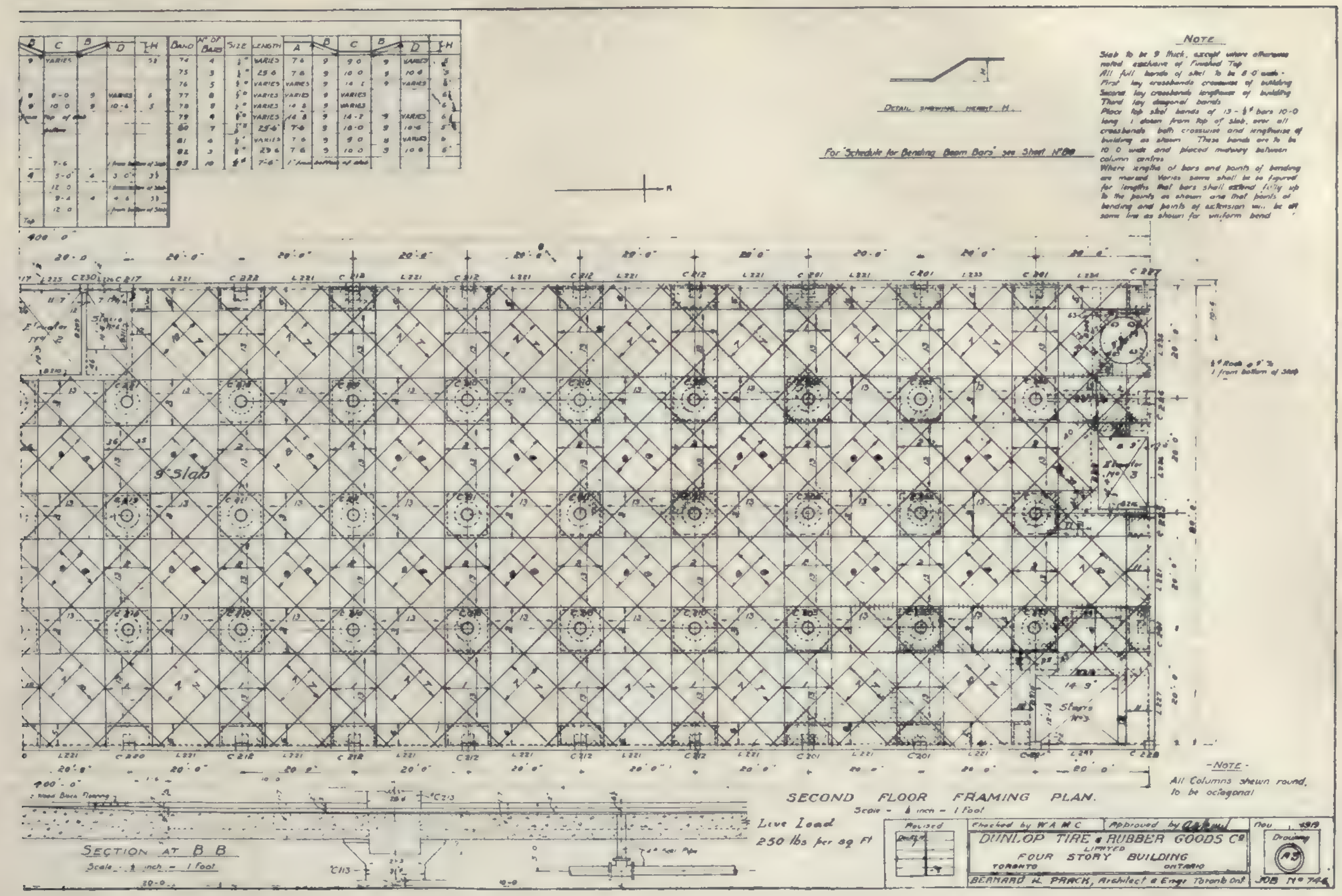


SECOND FLOOR PLAN.

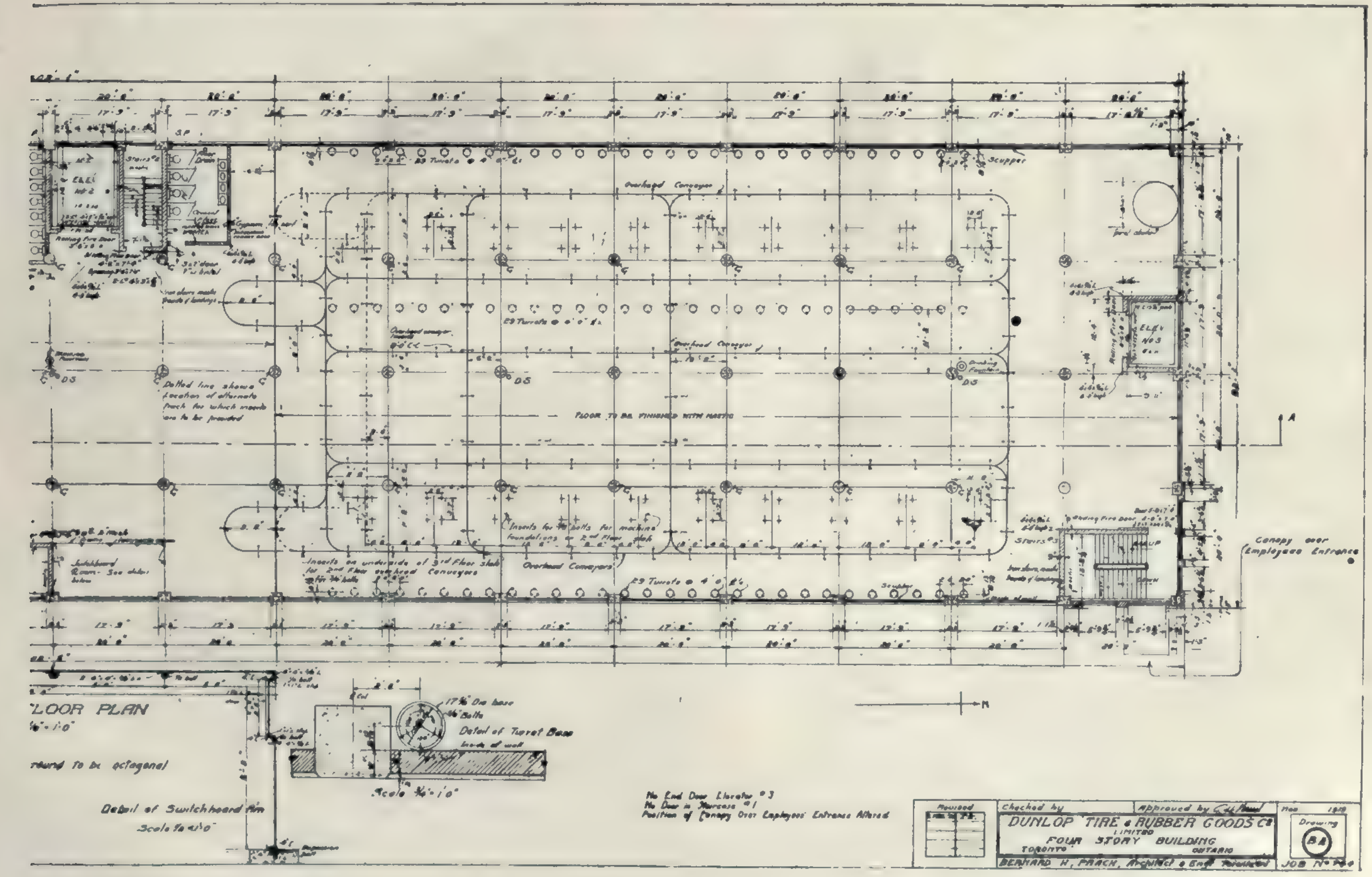
(Continued on opposite page.)

NEW FACTORY AND OFFICE ADDITION, DUNLOP TIRE & RUBBER GOODS COMPANY, TORONTO.

BERNARD H. PRACK, ARCHITECT AND ENGINEER.


NOTE
For Schedule for Bending Beam Bars see Sheet No B9
Detail showing height H.
9" Slab
Stairs No 3
SECOND FLOOR FRAMING PLAN.
Scale - 1/8 inch = 1 Foot
SECTION AT B B
Scale - 1/8 inch = 1 Foot
Live Load 250 lbs per sq Ft
NOTE - All Columns shewn round, to be octagonal
DUNLOP TIRE & RUBBER GOODS Co LIMITED
FOUR STORY BUILDING
TORONTO ONTARIO
BERNARD H. PRACK, Architect & Engr Toronto Ont
JOB No 744
A3

(*Continued from opposite page,*) SECOND FLOOR FRAMING PLAN.


Overhead Conveyor
Overhead Conveyors
Floor to be finished with mastic
Dotted line shows location of alternate track for which inserts are to be provided
Inserts on underside of 3rd Floor slab for 2nd Floor overhead Conveyors
Canopy over Employees Entrance
Stairs No 3
Scupper
LOOR PLAN
round to be octagonal
Detail of Switchboard Rm
Scale 1/4"=1'0"
Detail of Turret Base
Scale 3/4"=1'0"
DUNLOP TIRE & RUBBER GOODS Co LIMITED
FOUR STORY BUILDING
TORONTO ONTARIO
BERNARD H. PRACK, Architect & Engr Toronto
B2

(*Continued from opposite page,*) SECOND FLOOR PLAN.

NEW FACTORY AND OFFICE ADDITION, DUNLOP TIRE & RUBBER GOODS COMPANY, TORONTO.

BERNARD H. PRACK, ARCHITECT AND ENGINEER.

Pan-American Architects' Resolutions

The Pan-American Congress of Architects, the first event of its kind, and to which the Royal Architectural Institute of Canada was invited to send delegates, was held this year at Montevideo, Uruguay. The object of the Congress is to contribute to the development of architecture and to give stimulas to the artistic and scientific studies of the profession. It is the intention to make the Congress a permanent institution and to hold meetings every third year in the capitol of some American country. At the Montevideo meeting the following resolutions were adopted:

I.—CITY IMPROVEMENTS.

1. That the Government and municipal authorities of all American countries should legislate in regard to the adoption of uniform plans for towns and cities, the present system of "squares" to be followed only in exceptional cases; the laying out of parks and gardens, and the choice of plants, shrubs, etc.; the selection of suitable sites for public buildings and monuments; and the framing of regulations complementary to the above.

2. That a special course of "city improvements" should be included in the curriculum of colleges and schools of architecture, and that free classes should be given by the architects' societies.

3. That leagues should be founded in every American city to arouse, direct, and stimulate Government initiative.

4. That a "Pan-American City League" should be founded.

II.—BUILDING MATERIALS.

That the Governments of American countries should direct the attention of their institutes and state laboratories to improving the method of production and exportation of building materials peculiar to each country, and that the use of such material should be encouraged in every way. That an account of such investigations should be published by an international institute. That the architects' societies should form exhibitions of building materials and effect an interchange of such materials.

III.—PROFESSION OF ARCHITECT.

That, in order to improve the aspect of towns and cities, to frame definite rules as to the conditions of dwelling houses which influence to so great an extent the people's moral and physical well-being, to insure the beauty, safety and hygiene of every kind of building, and generally to diffuse culture, the degree of architect must be recognized by the State, and the duties of the profession, which is the only one in a position to deal with the problems under discussion, established by law.

IV.—CHEAP DWELLING-HOUSES.

That the Government and municipal Authorities should be encouraged to co-operate in the construction of dwelling houses that shall be both cheap and hygienic. That the construction of detached houses in the neighborhood of industrial and manufacturing centres should be encouraged, as also the erection of tenements in densely populated centres. That, before granting permission to build, the ground on which such houses are to be erected shall be supplied with drainage system, light and pavement. That the municipalities and departments concerned shall be required to modify the building regulations at present in force, adapting them to the economic needs of such buildings, in order to effect a saving in the execution of the works without leaving anything undone pertaining to the hygiene, safety, and general aspect of such buildings. That attention should be drawn to the desirability of founding in each country a "National Bank for the building of cheap houses," to which employers, capitalists, and wealthy land-owners should contribute. That night-shelters for those unable to afford a cheap and decent lodging should be built.

V.—PUBLIC CULTURE.

That to educate the public appreciation of architecture, exhibitions of applied arts should be held periodically. That the authorities should form museums of casts of the works of famous sculptors and architects, and that free access to public buildings and monuments should be granted. That a yearly prize for the best conceived and executed building should be awarded, and that lectures on the subject should be given in the primary and secondary schools of each country.

VI.—PROFESSIONAL RESPONSIBILITY OF THE ARCHITECT.

That the Governments of American countries should frame laws clearly defining the responsibility of the architect and that of the contractor.

VII.—ARCHITECTURAL TRAINING.

That, for any progress to be made in the architecture of American countries, special schools or colleges of architecture should be founded, in which the necessary artistic, technical, and scientific training would be given.

VIII.—"PAN-AMERICAN CENTRE."

That a "Pan-American Centre" should be formed, and that an interchange of professors and students of architecture should be effected between the various schools and America, thus creating a real professional solidarity.

IX.—BUILDING ACTIVITIES.

That the municipal authorities should be desired to study the modification of the system in force, with a view to increasing the tax on unoccupied sites. That all materials and machinery required for building purposes imported from abroad should be allowed to enter the country free of duty, and that the transport tariff should be revised in order to reduce freight rates. That the municipal authorities should be desired to modify the present regulations respecting the hygiene and safety of dwelling houses, with a view to transforming workmen's tenements into flats. That the public authorities should be urged to fight the trusts. That the training of competent workmen should be encouraged by the Government in their industrial schools, and that private concerns founded for the exploitation of any industry necessary to the building trade should be encouraged. That an improvement in the mortgage system should be studied, special mention being made of the system in force in the Argentine Mortgage Bank. That the laws of the country and the municipal regulations relative to building should be revised.

Cost Accounting and Efficiency

Stressing the fact that general cost systems cannot be bought to suit all circumstances, a writer in the BUILDER, London, states that the costing system should therefore be made to fit the job. Keeping this fact in mind, he declares, it would be well, however, to review several points of importance in cost accounting as applied to work of a civil character. The correct allocation of costs, the writer says, is very difficult to procure on any work with such a diversity factor as building and kindred work. But it will be found that the more work is organized for improved production the more easily will the details required to ensure correct allocation be obtained. Cost must show what has happened, not what might have happened, and it is a good idea to provide a set of costs which might be designated "inefficiency costs," into which all items of undoubted waste expenditure are placed, as such will enable the inefficiencies leading to the waste to be quickly located and steps taken to prevent recurrences.

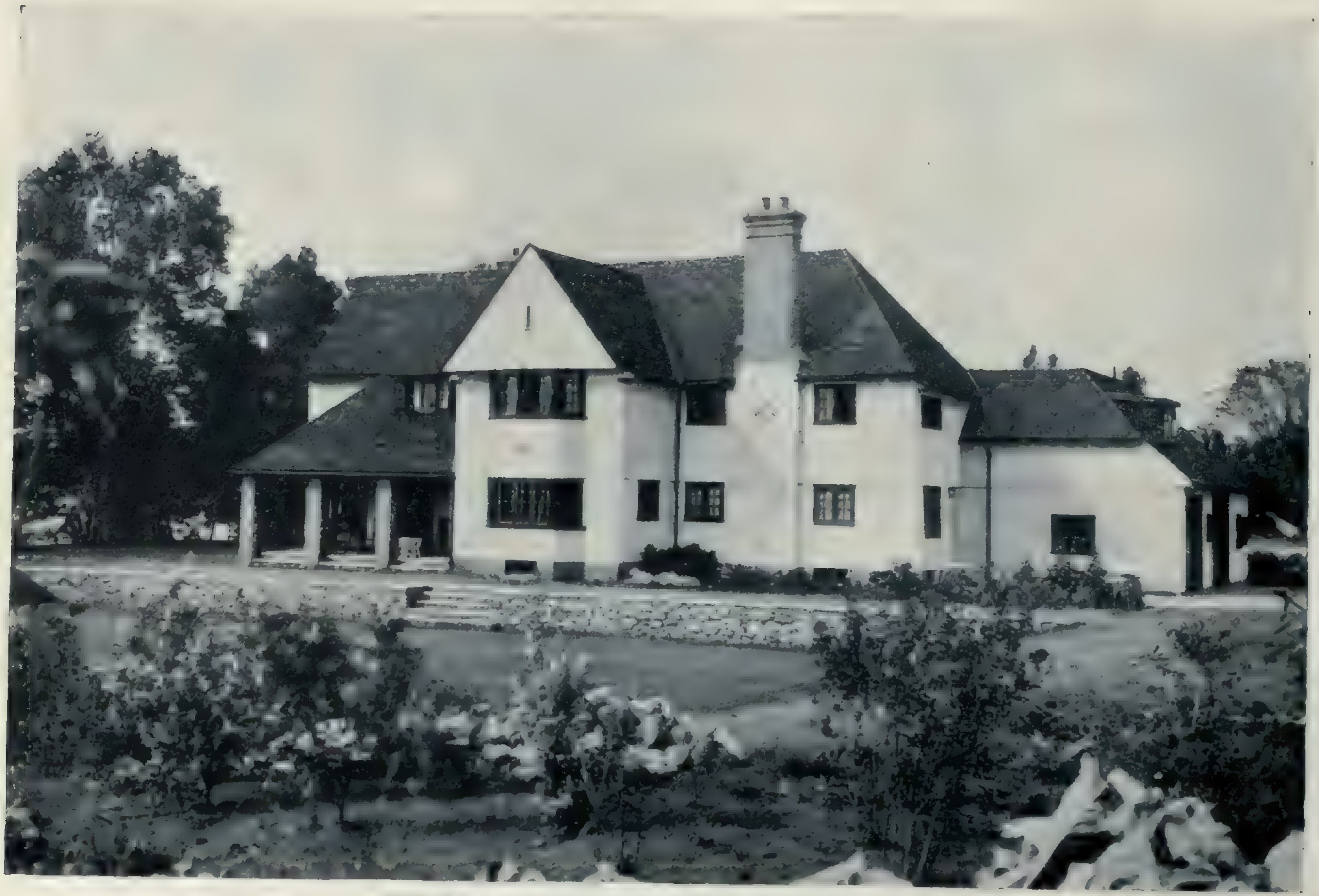
Under this heading of Inefficiency Costs might be shown all idle plant, as it is no fault of the job in hand that there is a quantity of plant which it is not necessary to use on it. Therefore only the costs of using the actual plant on the job should be charged to the costs of such, and the maintenance and depreciation of the idle plant charged to the Inefficiency Costs. In the same way, any large sum spent on maintenance of workshops or plant must be prevented from creeping into the costs of any job which happens to be in hand, as this is a charge which affects the employer more as a property owner, and if allowed to come into the costs of the work in hand will be sure to confuse the issue on some future occasion when the costs of that particular job are referred to.

There are certain charges which costing clerks will persist in averaging as being the easiest way out of a difficult question. This should not be allowed, as with a little trouble and insistence, these can always be definitely allocated to the job, thus providing for definite accuracy. The best means of ensuring that the necessary information is rendered by those responsible is to ask that it be entered on a suitable space on the job card, work sheet or time sheet, as the case may be, which is afterwards made the basis of payment; so that until the costing clerk has obtained his information and franked the card to the pay clerk the individual's pay is delayed.

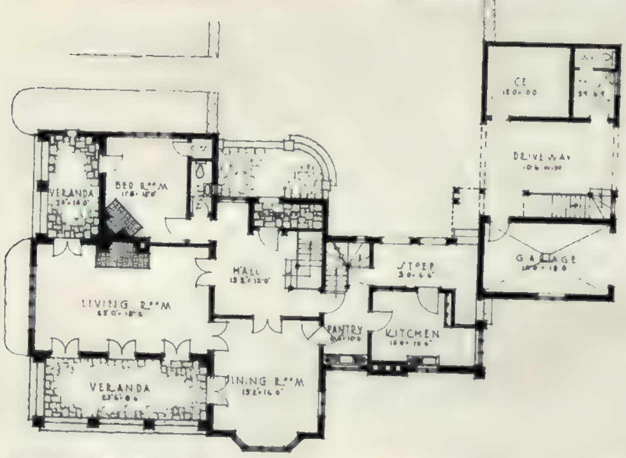
It should be a definite instruction that, unless an expenditure subserves efficiently in some way the work to which it is allocated, it is either an incorrect allocation or wasted expenditure. Overhead charges on unemployed plant or workshops show a state of things which should not exist and should be transferred to the inefficiency costs. Other items which might well find a resting place under this heading are: Waste of materials; unnecessary adjustments of plant; loss through accidents; extra payments for overtime where there is any question of the necessity for them. In this way direct attention is brought to bear on things which might otherwise escape notice in a general mass of costs.

It is essential that each particular job should be made to bear its fair burden, and not, as is now often the case, be saddled with some heavy charge which tends to favor the future or some other inefficient job. On the other hand, all equitable charges must be brought in, and on no account carried forward, as that would favor the present-day job at the expense of the future.

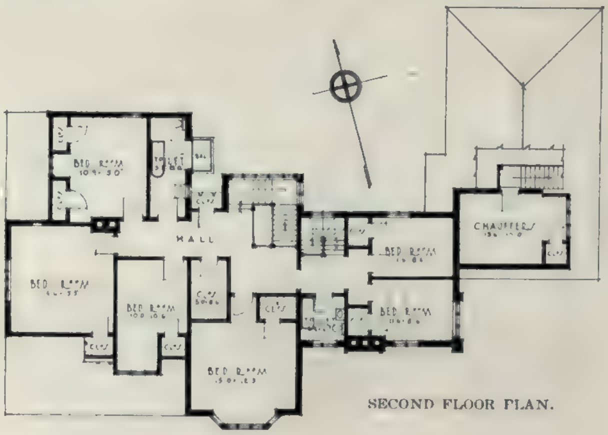
It is obvious that such carefully collated costs must, in conjunction with the data obtained by time-study, provide such a collection of material as will enable estimates to be made out with such accuracy that the possibility of big discrepancies between the estimated and actual costs of a job cannot arise. The necessity for accurate costing is very clear, for it is by means of carefully-compiled data and a further accurate analysis of it that those responsible are enabled to set up definite standards and improved methods. But after they are set up it is essential to have carefully recorded costs to facilitate their useful application.



GARDEN FRONT FROM THE SOUTH.



GROUND FLOOR PLAN.



SECOND FLOOR PLAN.

HOUSE OF
H. H. MASON, ESQ.
NEAR ROCHES POINT
LAKE SIMCOE.

ARCHITECT.
F. H. MARANI,

DRIVEWAY APPROACH TO ENTRANCE.

Two Lake Simcoe Houses

Scarcely less important than the designing of a house is the planning of the grounds which surround it. Only too frequently we see attractive houses completely ruined by ill-considered incongruous settings. For instance the quiet dignity of a Georgian city residence may be entirely spoiled by grounds lacking that degree of formality which alone could bring them in harmony with the building. Or again, a country house of rambling picturesqueness may have its lawns disfigured by beds of Cannas and Salvia, such as are usually associated with a city park.

In designing a garden it should be borne in mind that it cannot be considered as a unit in itself. Since it is dominated by the house it must of necessity be subservient to it, therefore, that portion of the grounds which immediately surround it should conform to its architectural style. The most successful garden is the one which is planned at the same time as the house and in conjunction with it. In no other manner can such a harmonious result be produced. No rule of thumb methods can be adopted in the designing of gardens, each site suggests its own requirements and many a pre-conceived rule has to be abandoned in order to preserve existing features of value or to adjust the design to difficult topographical conditions.

In the case of Mr. H. H. Mason's property at Lake Simcoe, there were but few obstructions to be considered. The land which has a gentle slope from the main road to the lake was devoid of trees except at the fringe of the lake shore. In order to obtain a good view across the lake and at the same time take full advantage of a south aspect for the flower garden, the house was placed near the north boundary close to the lake front. The entrance to the property is at the northeast corner and the driveway follows irregularly the north boundary to the carriage court at the east end of the building.

In order to give the house the desired feeling of elevation and to minimize the appearance of the ground falling towards the building, the main flower garden on the south front has been sunk 2½ feet. The sunken garden when completed will be laid out with formal flower beds grouped round a lily pond. A pergola at the

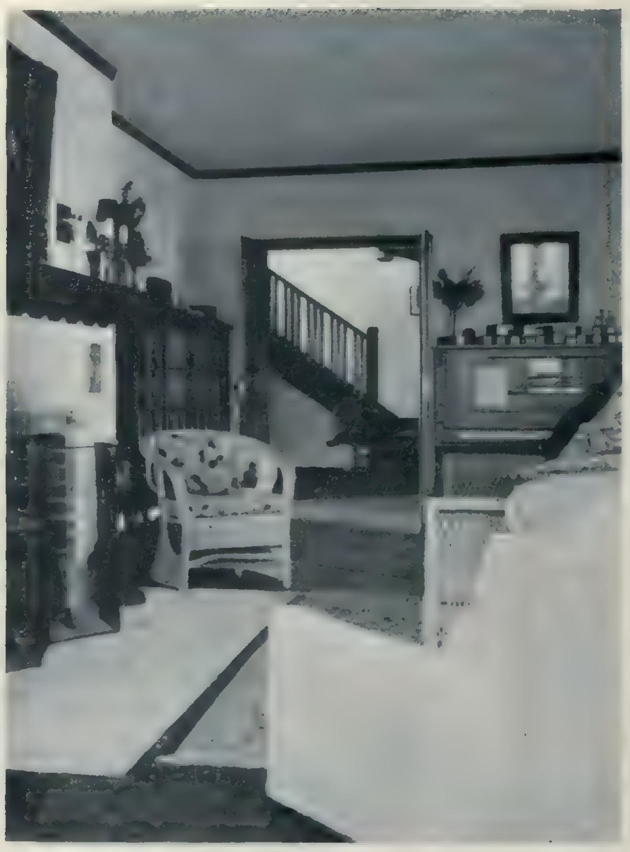
LIVING ROOM.

FIREPLACE IN LIVING ROOM.

MASON HOUSE,

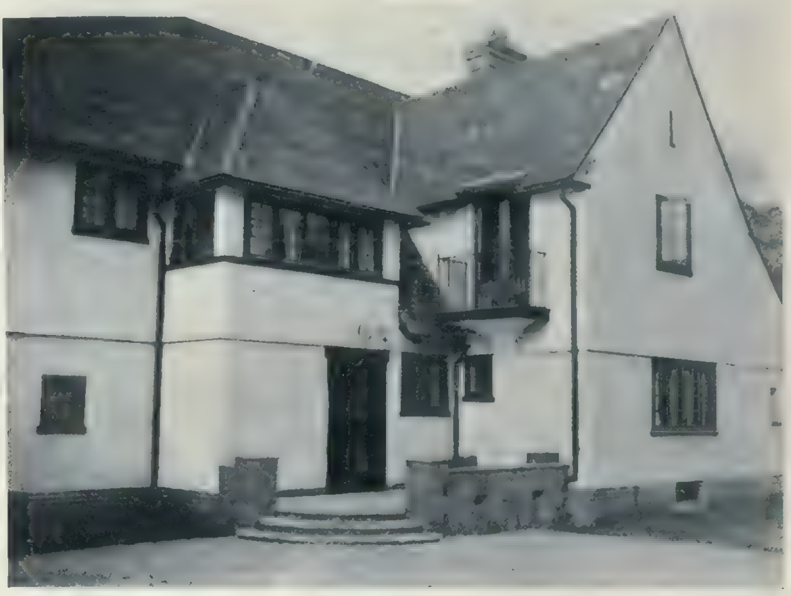
NEAR ROCHES POINT, LAKE SIMCOE.

VIEW FROM
LAKE SHORE.



LIVING ROOM
TOWARD HALL.

HOUSE OF
H. H. MASON,
NEAR ROCHES POINT,
LAKE SIMCOE.



DETAIL OF ENTRANCE.

VIEW FROM ROAD.

F. H. MARANI,
ARCHITECT.

east end will divide it from the kitchen and fruit garden, and a generous shrubbery plantation screens it from the adjacent property belonging to Mr. Baker. Herbaceous borders have been planted on the south terrace by the house and should give a pleasing note of color against the rough cast walls. The main herbaceous borders, however, run along the northern boundary of the property.

DINING ROOM: MASON HOUSE.

Unfortunately the only illustration in this article, showing a view of the garden, was taken when the grounds were still under construction and in a very incomplete condition.

In the planning of both the above properties the closest collaboration was maintained at all times between the Architect, Mr. F. H. Marani, and the Landscape Architects, Messrs. H. B. and L. A. Dunington-Grubb. The result has been that the greatest economies have been effected in the division of the property together with increased convenience, pleasure and comfort in the use of both house and grounds.

DETAIL OF FIREPLACE AND DOOR: BAKER HOUSE.

Both houses are planned so that the entrance front and the garden front are on different sides of the house.

In the Mason house, the garage, ice house, tool room and chauffeur's bedroom are grouped with the house, with an archway between the garage and ice house. This makes an interesting feature of the entrance, and gives a protected way from the house to the garage and ice house. It also provides shelter for an extra car if necessary.

The house is built of hollow tile, stuccoed, with the base, verandah posts and chimneys of dark red stock brick. The roof is covered with shingles dipped in Solignum.

The interior is finished in whitewood and birch and stained dark brown.

The Baker house is a frame house with stucco on metal lath to the tops of the ground floor windows, and above that wide clap boards stained with Solignum.

◆

Hardening Concrete

Experiments by the United States Bureau of Standards to develop a method of accelerating the hardening of concrete, especially when it is to be used in wet or damp situations, have shown that 4 per cent. of calcium chloride added to the mixing water increases the strength of concrete at the age of one day 100 per cent. or more. In some cases in two days the strength equalled 75 per cent. or more of that normally attained in one month.

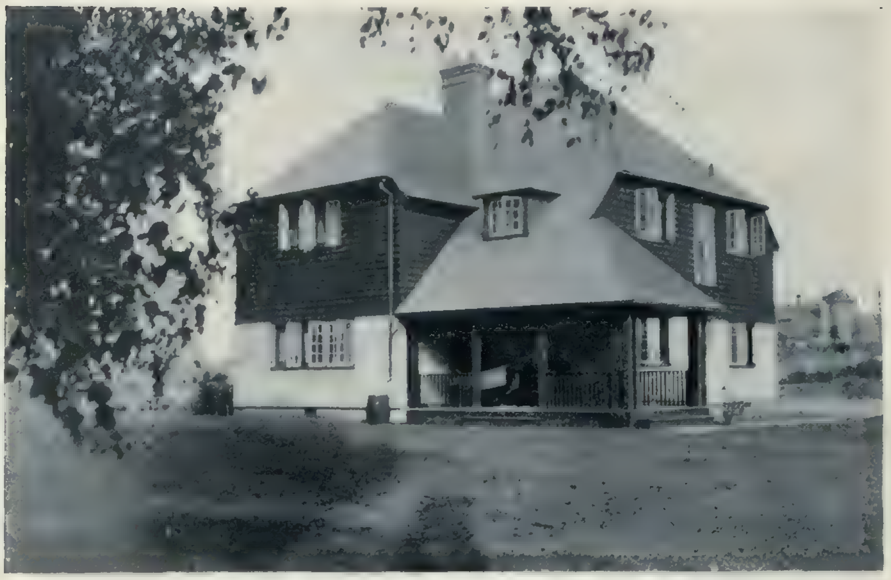
Preliminary work on the development of the Bridge River power site near Lillooet, B.C., is being carried on. The development will entail an expenditure of $30,000,000; the head will be 1,600 feet and 400,000 horse - power will be available.

◆

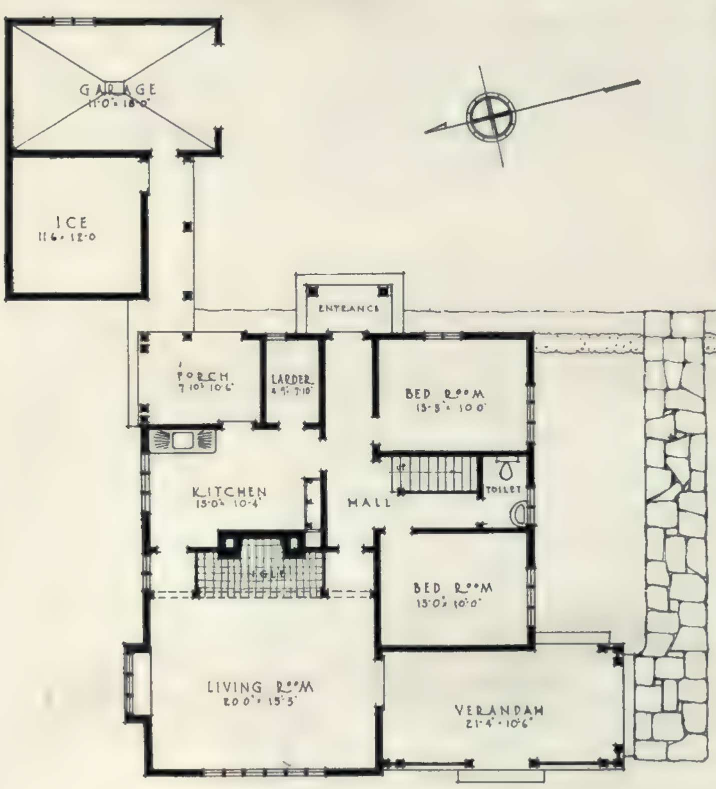
Will meet in London

Association of Contractors' The Mason the United States and Canada, which recently met in convention at Detroit, Michigan, has voted to hold next year's meeting at London, Ont.

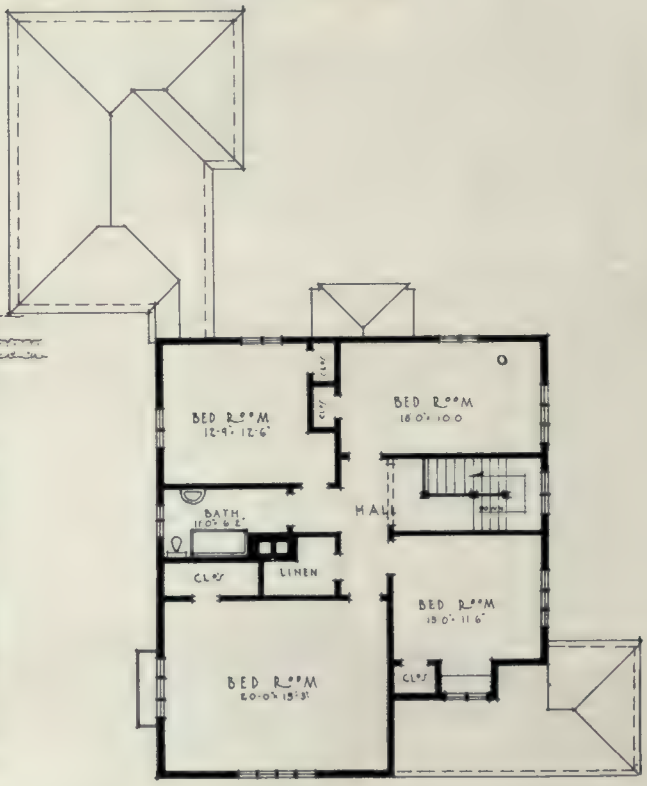
HOUSE OF
E. G.
BAKER, ESQ.
NEAR
ROCHES POINT,
LAKE SIMCOE.



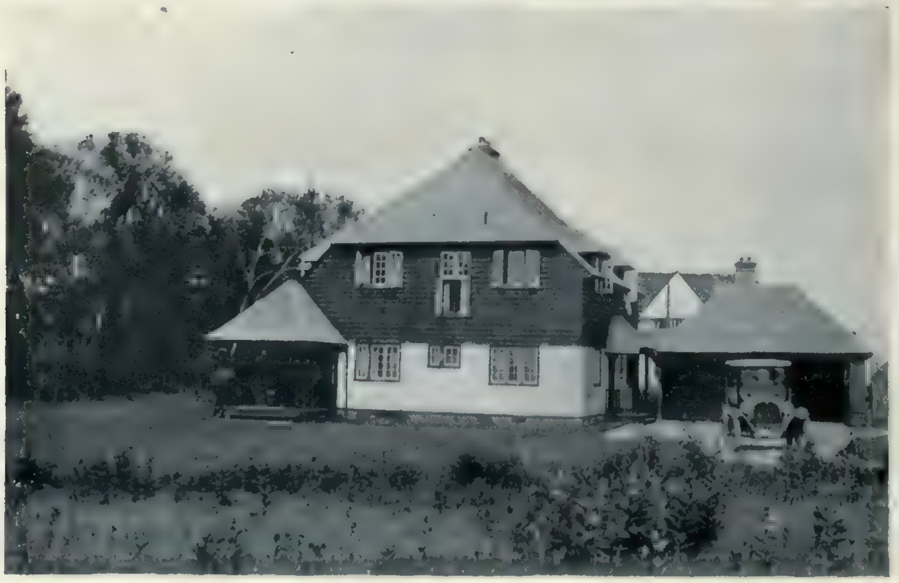
VIEW
FROM
LAKE.
SIDE.



FIRST
FLOOR
PLAN.



SECOND
FLOOR
PLAN.



VIEW
FROM
SOUTH.

F. H.
MARANI,
ARCHITECT.

The Flat Fee as a Measure of Equity

By John Lawrence Mauran.

(Reprinted from the Journal of the American Institute of Architects.)

ABOUT ten years ago one of our most loyal and important clients came to us with an alteration and remodelling problem involving a considerable expenditure compared to the result he was seeking. He was, as we well knew, a timid man in matters wherein architects feel they are on their home grounds, although bold enough in the financial and real estate field. The exigencies of time and the character of reconstruction led us, as a condition to fulfilling his wishes, to insist on the selection of a certain contractor on a cost plus basis, and in spite of the fact that in those good days now gone by the "cost plus" had a definite limit of liability of about two hundred thousand dollars, our client showed his timidity by hesitating over the indefinite amount of our fee of ten per cent. Although we could hardly fathom the causes of hesitancy, the inspiration of the moment led us to suggest that we would do the work—whatever it might cost—for a flat fee of twenty thousand dollars. With unmistakable relief he seized upon the suggestion, and everyone was happy even upon the day of completion a week ahead of time and with a saving of over seventeen thousand dollars. There is a psychology in it, for in spite of paying us some seventeen hundred dollars more than ten per cent., he had found security against the bugbear of increased costs involving increased architects' fees.

Now, every architect worthy of the name would hotly repudiate the implied suggestion of bad faith, but we must remember that often the client's mind visualizes added fees with any suggested betterment, no matter how high his confidence in the disinterested character of the suggestion.

From the deep impression left on us of the satisfaction of the owner, we profited a little later on when he retained us as architects for the first reinforced concrete building of any importance in St. Louis. It was an eight story wholesale building covering an entire city block, and at an early stage in the negotiations, we perceived symptoms which led us to repeat our offer of a flat all-inclusive fee.

Our attitude through both these experiences was a more or less passive acceptance of the state of mind of a client, but quite recently we caught again the same note in the comments of clients during preliminary conferences, sounding a vague alarm as to sky-rocketing of the fee in case of a pyrotechnic display in building costs.

This turned our thoughts to the two previous experiences, and changed our attitude from a passive one to an active advocacy of the fixed and all-inclusive fee, and late in 1919, when the material market had all the symptoms of an ascending escalator, we expressed our desire to fix in advance the *exact obligation of the client* for full architectural services including the fixed fees which we in turn agreed to pay the engineers engaged by us on work in their various branches.

Of course, the percentage system applied on the estimated cost furnished the basis for determining the fee named, but the fact that it was *fixed* gave our clients every assuarnce that their interests were paramount, and hence, while we were bending every endeavor to protect them against spectacular advances, there could be no possible ground for even the unformulated suspicion that we, too, were profiteering at their expense through the unpreventable increases in cost over the already high level of the moment.

While there was a certain amount of surprise expressed, there were unmistakable signs of appreciation of what commended itself to them as to us, as a businesslike co-operation insuring justice to all concerned, for the surprise centred about an unsuspected flexibility of the architect's mind in his methods of calculating his remuneration.

It may prove of interest to record the rather unusual method we adopted in the handling of these commissions under very unusual and very trying conditions. First of all, we urged the immediate *selection* of a contractor of proved ability in the particular type of work, of absolute integrity and whose conditions of other work in progress at the moment justified such a step.

We further assured our clients that they could engage such a cotnractor to perform the work at cost plus a *fixed fee.* We also pointed out that in the purchase of material long in advance of the preparation of plans and specifications, that the logical method of handling such an undertaking was through the functioning of a "committee of the whole," consisting of owner, architect, contractor, the owner's operating engineer or manager, and the archtect's engineers (structural mechanical, electrical, etc.) sitting together with one common purpose to discuss, decide and act on every matter whether of purchase or the choice of methods and materials.

Another phase of "all-inclusiveness" as pertaining to the architect's fee (however arrived at) is the oft-time unspoken objection in the client's mind to the little understood separate payment of the clerk of the works, as well as the engineers. One of our clients voiced this feeling recently when he blurted out, "We paid for your superintendents on the last job." From our recent experiences I can vouch for the fact that while we have been fully reimbursed, our clients' satisfaction in the "all-inclusive fixed fee" has fully justified its adoption.

In looking back over the operation of the "committee system," the application of the "fixed fee" to sub-contractors as well as the general contractor, and especially to our own "all-inclusive fixed fee" for architectural and engineering services, there were many occasions which sprang to mind when we were thankful, indeed, not only because the disinterested character of our services excluded them from the often trying discussions over jumping prices, but more particularly because of the comfortable feeling that while we were being adequately paid for the service rendered, we were not profiting by the misfortunes of our clients, and so we feel that we can conscientiously commend to the profession and to our future clients, "the flat fee as a measure of equity."

Report of New York Architects on Housing

At a meeting on November 18th, the New York State Association of Architects adopted a report incorporating an analysis of the housing problem as affecting that State and embodying recommendations for legislation, which, in view of the subject, is of general interest, and from which the following is quoted in part:—

The housing problem is not a new nor a temporary problem. Rent legislation will not solve it. Offers of bounties to the speculative builders can only at the best serve to resurrect an incompetent system that in a wasteful manner has given a small proportion of us quite unsatisfactory dwelling places.

We can only hope to start the machinery of house production and to make it function for the good of the community by a charge in our attitude in regard to the part that must be played by credit, materials, labor, land, planning and the State.

The control of credit is mainly in the hands of a small group of men. These heads of the banks and insurance companies are responsible to their stock and bond holders to get the greatest possivle profit on their investment. Housing is risky. It does not pay as well as other investments. And so they will not lend money for investments. But the credit which they lend is based on the saving of working men and women. These same people are congested in a manner which endangers health and happiness while their money is used to build theatres and garages.

There is no solution of the housing problem until the control of credit becomes a public function. Credit for housing must be used where it is most needed and when it is most needed. This will be possible when the State lends its money or credit for housing at a low rate of interest and for long terms, or when the people finance the building of their own homes by forming credit unions for that purpose.

Material and building service, like money, are practically unattainable for housing. There has not been material or organized and trained labor enough for all purposes. Bricks have been used for loft building, not for houses; glass needed for homes has gone into automobiles. There is reason to believe that the scarcity of materials has, at least in part, been created by curtailment of supply for the purpose of keeping prices high enough to pay large profits. It is apparent that a stronger control by the public of the manufacturing and distribution of essential material is needed. But this alone will not suffice. All unnecessary waste and undue profit must go if we are to bring the cost of housing within the means of the more poorly paid half of the population.

Workers in the building trades are not giving their full effort. In part, this is due to the disorganization that has resulted from the war. But there are more deep-seated causes. Artisans and laborers are discontented, perhaps because they feel that their efforts will not so much serve to promote their own interests as to enrich speculators and landlords who may afterwards squeeze them without mercy. If they felt that buildings were erected for the purpose of serving the need of the workers and the public in general instead of for profit, it might be more possible to get a full and enthusiastic day's work from workers.

The cost of land alone, according to the housing report of the Reconstruction Commission, is "generally sufficient to prevent a large part of the workers from escaping from the slums." The value of land increases with the congestion of population. However, the individuals who are crowded together in our cities get none of the increase which results from their being crowded together in insufficient quarters. The land increment is wasted in land speculation; it is ultimately added to the cost of houses. A means must be found to preserve this unearned increment for the use of the community.

Even if there were available and cheap enough credit, land, material and labor to build decent homes for all, the housing problem could not be solved without a proper plan. Planning is the function of the architect. Much progress has been made during the last decade in the design of individual houses and groups of dwelling places. But the housing problem of our large cities cannot be solved by more houses. The unrestrained and unguided growth of New York shows the waste that comes from lack of foresight in planning our communities. There is not room for the population to live comfortably, decently or healthfully near their work. Transportation cannot solve the problem. The subways are inhumanly packed. There are not streets enough to care for our traffic. New York has grown without plan to the point where it is choking its own growth. More houses—without a proper plan for their location—can only lead to more congestion and more expensive homes. All effort will be wasted if we further increase the size of our unhealthy and inefficient great cities. We should plan to decentralize our population by developing smaller, self-contained communities in which sufficient space is provided for agriculture, industry and organized social life. These should be small enough so that every family may have a garden and every worker may walk to and from his work, and large enough to allow efficient industrial organization and the social, educational and cultural activities that make city life attractive. They should be surrounded by a belt of land that should be restricted for all time to farming and recreation.

Governmental housing, though necessary as a temporary means of averting a crises, seems dangerous and unsafe as a permanent policy. Municipalities should be given whatever power, if necessary, including that of building homes, to avert the dangers that are threatened by the present lack of sufficient houses. But the permanent function of the State in regard to housing should be that of education and of guidance of the various agencies that must need cooperate to give us sufficient, adequate homes, properly placed in relation to work, recreation and food supply. For this purpose the State and local housing agencies are badly needed.

As a first step forward in the development of such a housing programme, we recommend the adoption by the State of the recommendations of the Reconstruction Committee:

1. That a law be enacted requiring the appointing of local housing boards in communities having a population of over 10,000 and the appointment of a central State housing agency for co-ordinating local effort.

2. That a constitutional amendment be enacted permitting extension of State credit on a large scale and at low rates to aid in the construction of moderate priced homes.

3. That an enabling act be passed permitting cities to acquire and hold or let adjoining vacant lands and, if necessary, to carry on housing.

New British Engineering Society

A new engineering society has been formed in Great Britain to encourage the study of the history of engineering and industrial technology. The founders claim that this field has been neglected and that the world does not appreciate how much it owes to the British and other engineers who have done greater service to the world than generals and politicians. Many distinguished British engineers have interested themselves in the formation of this body, which will be known as the Newcomen Society. Members will be sought in the British Colonies and Dominions, and also in other countries.

Physical Characteristics of Birch, Beech and Maple

Birch, beech and maple are very similar in appearance, and have approximately the same weight. Hence it is comparatively easy to mistake one of them for another. A method which anyone can use to distinguish them is suggested by the U.S. Forest Products Laboratory. The method makes use of the relative width of the pores and medullary rays in the three woods.

If the end grain of birch, beech or maple is cut smooth with a sharp knife and examined with a hand lens, the pores will be seen as tiny holes distributed fairly evenly over the surface, and the medullary rays will appear as narrow lines of a different shade running at right angles to the growth rings.

In beech some of the rays are very distinct even without a lens. The large rays are fully twice as wide as the largest pores.

In maple the rays are less distinct, and the largest are about the same width as the largest pores.

In birch the rays are very fine, invisible without a lens. The pores are several times larger than the rays, usually being visible to the unaided eye as minute holes on the end grain and as fine grooves on dressed faces of the board. The pores in birch are considerably larger than the pores in beech or maple.

Legs vs. Architects

Clarence Day, Jr.

I don't know how many persons who hate climbing there are in the world; there must be, by and large, a great number. I'm one, I know that. But whenever a building is erected for the use of the public the convenience and rights of such persons are wholly ignored.

I refer, of course, to the debonair habit which architects have of never designing an entrance that is easy to enter. Instead of leaving the entrance on the street level so that a man can walk in, they perch it on a flight of steps, so no one can get in without climbing.

The architect's defence is, it looks better. Looks better to whom? To architects, and possibly to tourists who never go into the building. It doesn't look better to the old or the lame, I can tell you; nor to people who are tired and have enough to do without climbing steps.

I admit there is a dignity and beauty in a long flight of steps. Let them be used, then, around statues and monuments, where we don't have to mount them. But they become a highly unwelcome form of beauty when they add, each day, to the exertions of everyone, and shut out some of the public completely.

Suppose that, in the eye of an architect, it made buildings more beautiful to erect them on poles, as the lake dwellers did, ages back. (It would be only a little more obsolete than putting them on top of high steps.) Would the public meekly submit to this standard and shinny up poles all their lives?

Let us take the situation of a citizen who is not a mountaineering enthusiast. He can command every modern convenience in most of his ways. But if he happens to need a book in the Public Libary what does he find? He finds that some architect has built the thing like a Greek temple. It is mounted on a long flight of steps, because the Greeks were all athletes. He tries the nearest university librar.y It has a flight that's still longer. He says to himself (at least I do), "Very well, then, I'll buy the damn book." He goes to the bookstores. They haven't it. It is out of stock, out of print. The only available copies are those in the libraries, where they are supposed to be ready for everyone's use; and would be, too, but for the architects and their effete barricades.

This very thing happened to me last winter. I needed a book. As I was too lame to get in the library myself, I asked one of my friends to go. He was a young man whose legs had not yet been worn out and ruined by architects. He reported that the book I wanted, being on the reference shelves, could not be taken out. I could go in there and read it, all I wished, but not take it away with me.

"Yes, but how am I going to get in?" I said. "My legs can't mount that rampart."

He said there was a side entrance. We went there, but there, too, we found steps.

"After you once get inside, there is an elevator," the doorkeeper said.

Isn't that just like an architect! To make everything inside as perfect as possible, and then keep you out!

I afterward thought of going in the back way, at the delivery entrance for trucks. My plan was to go in a packing-case, disguised as the "Memoirs of Josephine," and let them haul me upstairs before I revealed I was not. But they turn those cases upside down and every which way—it would be as bad as going over Niagara.

If there must be a test imposed on everyone who enters a library, make it a brain test that will keep out all readers who are weak in the head. No matter how good their legs are, if they haven't enough brains, keep 'em out. But, instead, we impose a leg test, every day of the year, on all comers, which lets in the brainless without any examination at all, and shuts out the most scholarly persons unless they have legs like an antelope's.

It is the same at the Metropolitan Museum, and at most of our clubs. Why, they are even beginning to build steps in front of our great railway stations, in order to make it that much more difficult for people to travel, and to discourage them and turn them back if possible at the start of their journey. And all this is done in the name of art. Why can't art be more practical?

The remedy is simple. No architect who had trouble with his own legs would be so inconsiderate. His trouble is, unfortunately, at the other end. Very well, break his legs. Whenever we citizens engage a new architect to put up a building, let it be stipulated in the contract that the board of aldermen shall break his legs first. The only objection I can think of is that his legs would soon get well. In that case, elect some more aldermen and break them again.—*Harper's Magazine.*

Anglin-Norcross, Limited, Hold Conference

The annual conference and banquet of Anglin-Norcross, Limited, attended by the headquarter and field executive staffs, was held in Montreal on November 29-30. In addition to staff meetings at which matters of organization and coordination were discussed, opportunity was also taken of the occasion to visit a number of city contracts, as well as the Food Specialists of Canada exhibit and the film exchange of the Canadian Amusement Company.

CONSTRUCTION

A · JOURNAL · FOR · THE ARCHITECTURAL
ENGINEERING · AND · CONTRACTING
INTERESTS · OF · CANADA

H. GAGNIER, LIMITED, PUBLISHERS
Corner Richmond and Sheppard Streets.
TORONTO - - - - CANADA
M. B. TOUTLOFF, Editor
W. H. HEWITT, Advertising Manager.

BRANCH OFFICES:
MONTREAL—171 St. James Street,
C. S. Soutter, Representative.
WINNIPEG—336 Qu'Appelle Street,
F. C. Pickwell, Representative.
NEW YORK—505 Fifth Avenue.
F. Watson, Representative.
CHICAGO—608 Otis Bldg.
C. E. Goodman, Representative.

CORRESPONDENCE.—All correspondence should be addressed to "CONSTRUCTION," Corner Richmond and Sheppard Streets, Toronto, Canada.

SUBSCRIPTIONS.—Canada and Great Britain, $3.00 per annum. United States, the Continent and all Postal Union countries, $4.00 per annum, in advance. **Single copies, 50c.**

ADVERTISEMENTS.—Changes of, or new advertisements must reach the Head Office not later than the twentieth of the month preceding publication to ensure insertion. Mailing date is on the tenth of each month. Advertising rates on application.

CONTRIBUTIONS.—The Editor will be glad to consider contributions dealing with matters of general interest to the readers of this Journal. When payment is desired, this fact should be stated. We are always glad to receive the loan of photographs and plans of interesting Canadian work. The originals will be carefully preserved and returned.

Entered as Second Class Matter in the Post Office at Toronto, Canada.

Vol. XIII. Toronto, Dec. 1920 No. 12

Materials and Prices

Despite unsettled conditions, Canada altogether has had a good building year. The volume of work carried out is estimated in published reports at approximately $245,000,000, as against $180,000,000 in 1919, and yet it must be said if half of the buildings planned, but held up, had gone ahead, the total would have been far in excess of the amount stated. Prices or rather the expectancy that prices will be lower has been mainly responsible for holding back a large number of projects; and while this expectancy has been realized in the case of a few materials, yet prices in general have remained for the most part constant. The reason for this is ascribed to the high cost of labor and the fact that in many lines of manufacture there is no great surplus of building materials. The opinion holds that building can be done for as low a cost within the next few months as it can within the next three years. It is maintained that prices will not show any decided drop until labor becomes more efficient and that the owner who builds now will have the use and advantage of an equity which will, to a large extent, offset any decrease which might subsequently follow. There is no question but what many buildings are badly needed and that the matter of housing is still an acute problem. The feeling is that considerable work of this character will go ahead and that a large number of deferred projects, in architectural and other offices, will be brought to a point of development. Altogether the outlook is not without its hopeful signs, and there is no doubt but that the next twelve months will witness an improvement in the total building volume over the year which is just coming to a close.

◆

Battlefield Memorial Competition

Based on conditions as outlined in the article by Mr. Percy E. Nobbs, M.A., F.R.I.B.A., R.C.A., in the last issue of CONSTRUCTION, it is announced that the Dominion Government will shortly issue an advertisement notifying architects, artists and sculptors of the terms of the competition for the eight memorial monuments to be erected on the battlefields in France and Belgium.

The competition is to be held in two stages: in the first, competitors will be required to submit only sketches which will be judged by the following board of assessors: Professor C. H. Reilly, representing the Royal Institute of British Architects; Paul F. Cret, representing the "Société Centrale des Architectes of France"; and Frank Darling, representing the Royal Archiectural Institute of Canada.

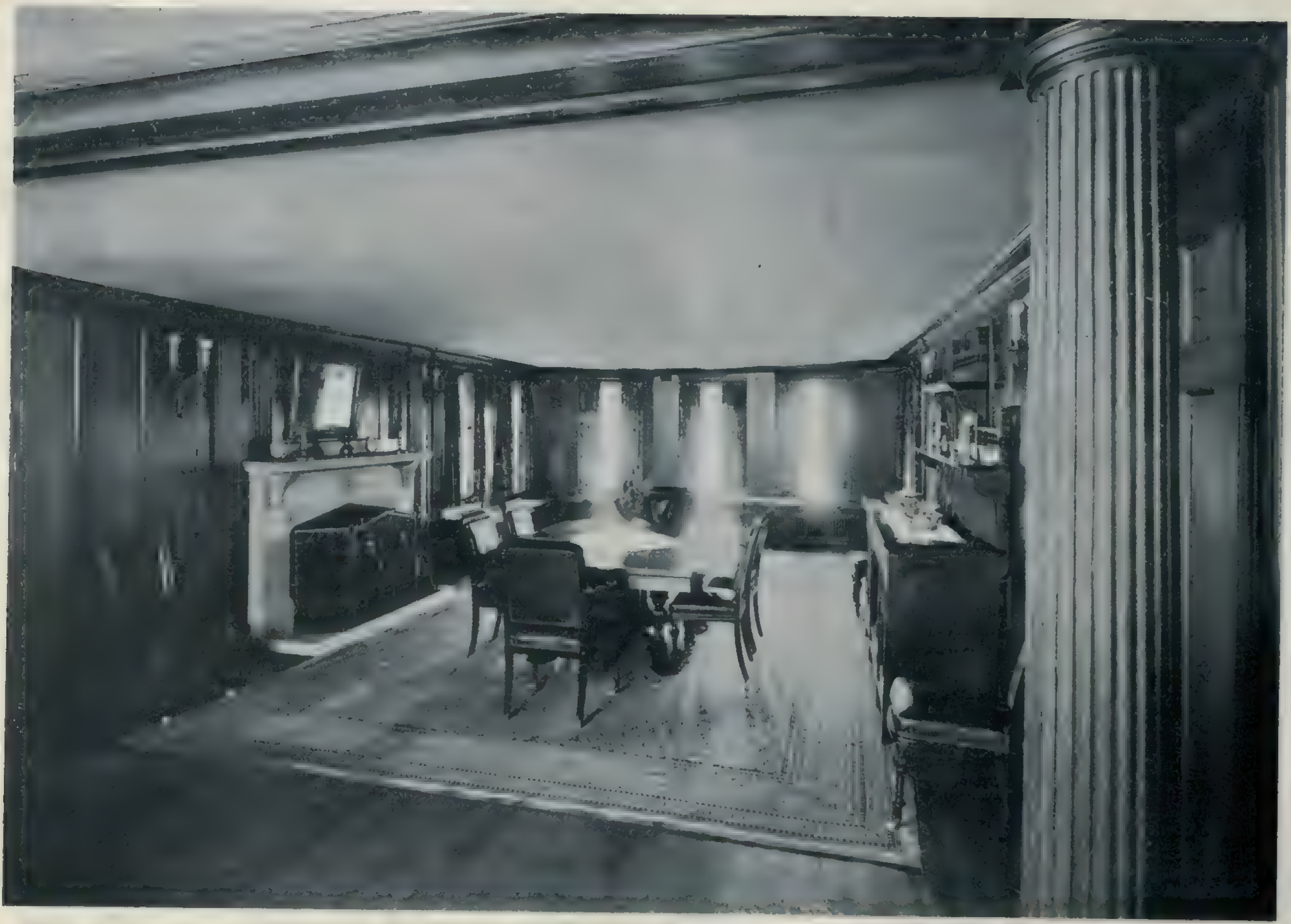
The judges will select the best designs, not to exceed twenty in number, and the persons submitting these will be eligible to enter the second stage, in which models of the designs will be required. The sum of $500 will be allowed to each contestant to cover the cost of models.

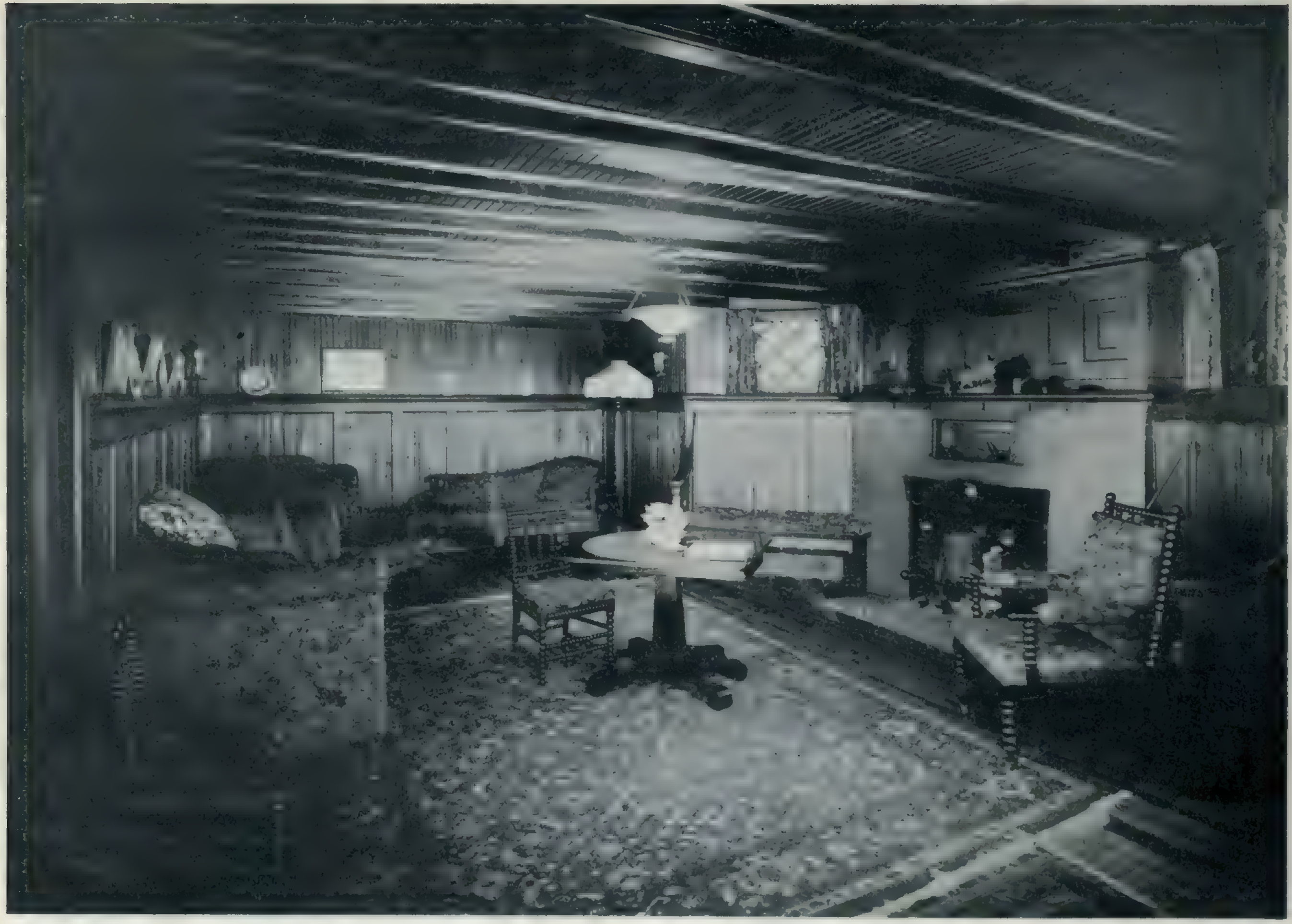
The competition will be limited to bona fide residents of Canada, and the date fixed for the submission of designs in the first competition is March 15, 1921. The award will be made almost at once, and conditions for the second stage probably issued about April 20.

◆

Duties on Imported Plans

Representatives of the Royal Architectural Institute of Canada recently appeared before the Tariff Commission with a view to seeking more adequate protection in reference to competition from outside architects. The question is one which is involved with the economic development of the country, and one which it is hoped the Commission will thoroughly consider. In this connection, the architects are endeavoring to have a duty imposed on specifications coming into the country in addition to the 2 per cent. now levied on plans.





DINING ROOM REMODELLED HOUSE OF J. N. GREENSHIELDS, DANVILLE, QUE. LIVING ROOM
HOGLE & DAVIS, ARCHITECTS.
(Exterior View and Billiard Room Illustrated in the July Issue.)

CONSTRUCTION

INDEX TO VOLUME XIII. JANUARY, 1920-DECEMBER, 1920

FRONTISPIECES—FULL PAGE ILLUSTRATIONS

Title	Month
The Hunter Building, New Government Offices, Ottawa, Ont.	January
Quaint Bits of York, England	February
Military Hospital, Ste. Anne de Bellevue, P.Q.	
Military Hospital, Camp Hill, Halifax, N.S.	March
Bankers' Bond Building, Toronto, Ont.	April
Great Hall, Hart House, University of Toronto	May
Henry Sproatt, LL.D., R.C.A., Designer of Hart House	June
King Edward Hotel (Addition)	July
Details of Fragments, Acropolis, Athens	August
Oratory in a Montreal Residence	September
Housing Scheme, Well Hall, Woolwich, England	October
Grand Staircase, Pantages Theatre, Toronto, Ont.	November
Ottawa Civic Hospital, Ottawa	December

ILLUSTRATIONS

Exterior views denoted by Ex., Interior by In., Plans by Pl.

Title and Location		Architect	Month	Page
BANK AND TRUST BUILDINGS—				
Bankers' Bond Building, Toronto, Ont.	Ex., In., Pl.	J. A. Mackenzie	April	105-107
Canada Trust Building, Toronto, Ont.	Ex., Pl.	Watt & Blackwell	April	108
Huron & Erie Mortgage Corporation (Branch), London, Ont.	Ex.	Watt & Blackwell	April	109
DEVELOPMENT SCHEMES—				
Proposed Water Front Development, Hamilton, Ont.	Pl.		January	32, 33
FACTORIES AND WAREHOUSES—				
Ideal Bread Company's Building, Toronto, Ont.	Ex., In., Pl.	Sydney Comber	January	14- 17
Dowsley Spring & Axle Company, Chatham, Ont.	Ex., In.	Wm. F. Sparling Co.	January	18- 19
Canadian Co-operative Wool Growers' Limited, (near) Weston, Ont.	Ex.	Shepard & Calvin	January	20
Crane Limited, Montreal	Ex., In., Pl.	Brown & Vallance	February	46- 48
Williams & Wilson Limited, Montreal	Ex., In.	T. Pringle & Son	February	49- 52
Carswell Company, Limited, Toronto, Ont.	Ex., In., Pl.	C. H. Acton Bond	February	53- 54
Hobberlin Building, Toronto			October	323
Dunlop Tire & Rubber Goods Co., Toronto	Ex., In., Pl.	Bernard H. Prack	December	383-388
HOSPITALS—				
Military Hospital, Ste. Anne de Bellevue, Que.	Ex., Pl.		March	70- 71
Military Hospital, Halifax, N.S.	Ex., Pl.		March	70- 71
Military Hospital (Service Building), North Toronto	Pl.		March	72
Military Hospital (Mess Unit), Fredericton, N.B.	Pl.		March	73
Military Hospital, London, Ont.	Ex., Pl.		March	74- 77
Military Hospital, Winnipeg, Man.	Ex., Pl.		March	72
Military Hospital, North Toronto			March	80- 82
Military Hospital, Whitby, Ont.	Ex.		March	87
Military Hospital (Recreation Building), Cobourg, Ont.	Ex.		March	90
Military Hospital, Kingston, Ont.	Ex., In.		March	91
Military Hospital, Hamilton, Ont.	Ex.		March	92
Military Hospital, Tranquille, B.C.			March	92
Military Hospital, Keith, Alta.	Ex., Pl.		March	94- 95
Military Hospital (Mess Unit), Kentsville, N.S.	In.		March	96
Military Hospital (Stores Building), Guelph, Ont.	In.		March	97- 98
Nurses' Residence, St. Michael's Hospital, Toronto, Ont.	Ex., Pl.	Hynes, Feldman & Watson	November	358, 359
Ottawa Civic Hospital	Ex., Pl.	Stevens & Lee	December	371-374
HOTELS—				
King Edward Hotel (Addition), Toronto	Ex., Pl.	Esenwein & Johnson; Watt & Blackwell, Associated	July	202-215
HOUSES—				
Point Cavagnol, Como, P.Q., N. Scarth Stevenson.	Ex., In., Pl.	Phillip J. Turner	June	172-175
Port Credit, Ont., M. Langmuir	Ex., Pl.	Molesworth, West & Secord	June	176, 177
Toronto, Ont., H. B. Taber	Ex., In., Pl.	Maurice D. Klein	June	178, 179
Toronto, Ont., Mrs. T. G. Brough	Ex., Pl.	Eden Smith & Sons	June	180, 181
Toronto, Ont., A. A. Bowman	Ex., Pl.	Eden Smith & Sons	June	182
Toronto, Ont., F. C. Thompson	Ex., Pl.	Eden Smith & Sons	June	183

ILLUSTRATIONS—*Continued*

Title and Location		Architect	Month	Page
Peterborough, Ont.	Ex., In.	C. H. Acton Bond	June	184, 185
Toronto, Ont., Thomas Mix	Ex., Pl.	Molesworth, West & Secord	June	186, 187
Toronto, Ont., Sidney Smith	Ex., Pl.	Molesworth, West & Secord	June	188, 189
Toronto, Ont., John M. Bowman	Ex.	J. W. Siddall	June	190
Georgeville, Que., Old Colonial House	Ex., In., Pl.		July	203-206
Sagus, Mass., Boardman House	Pl.		July	206
Pigeon Cove, Mass., Old House	Ex.		July	207
Medford, Mass., The Cradock House	Ex.		July	207
New Jersey, The Demorest House	Ex.		July	207
Hackensack, N.J., The Hopper House	Pl.		July	208
Cambridge, Mass., The Craigie House	Ex.		July	208
Montreal, Cote des Neiges Road, Old House	Ex.		July	209
Ahuntsic, Que., Old House	Ex.		July	209
St. Vincent de Paul, Ile Jesu, Que., Old House	Ex.		July	209
St. Eustache, Que., Old House (about 1820)			July	209
St. Eustache, Que., Old House (about 1830)			July	209
Danville, Que., J. N. Greenshields	Ex., In., Pl.	Hogle & Davis	July	216, 217
Danville, Que., Mrs. Mackay	Ex., In., Pl.	Hogle & Davis	July	218, 219
Township of London, Col. H. Williams, M.D.	Ex., In., Pl.	John M. Moore	July	220, 221
Toronto, Ont., Mrs. C. C. E. Malloch	Ex., In., Pl.	Harold R. Watson	August	250-252
Toronto, Ont., Edward Newell	Ex., Pl.	Harold R. Watson	August	253
Toronto, Ont., A. E. Boothe	Ex., Pl.	Harold E. Watson	August	254
Toronto, Ont., Group Development, Lyndhurst Avenue	Ex., Pl.	Harold E. Watson	August	255-257
Toronto, Ont., J. D. Woods	Ex., In., Pl.	Page & Warrington	September	288-290
York Mills, Ont., Mrs. Charles Catto	Ex., Pl.	Page & Warrington	September	290, 291
Toronto, Ont., Forsey Page		Page & Warrington	September	292, 293
Oakville, Ont. (Tennis House), Sir Frank Baillie	Ex., In., Pl.	Page & Warrington	September	294
Roches Point (Lake Simcoe), Ont., H. H. Mason	Ex., In., Pl.	F. H. Marani	December	391-394
Roches Point (Lake Simcoe), Ont., E. G. Baker	Ex., In., Pl.	F. H. Marani	December	394, 395
Danville, Que., J. N. Greenshields	In.	Hogle & Davis	December	400

HOUSING SCHEMES—

Title and Location		Architect	Month	Page
Housing Scheme, Well Hall, Woolwich, Eng.	Ex.		October	302
"Old Oak," London County Council Development			October	303
Letchworth, England			October	304, 305
Hamstead Way, Hamstead, England			October	306

MEMORIALS—

Title and Location		Architect	Month	Page
Dr. Young Memorial Fountain, Toronto, Ont.		Maurice D. Klein	August	247
War Memorial, Stratford, Ont.		Walter S. Allward (Sculptor)	August	264

OFFICE BUILDINGS—

Title and Location		Architect	Month	Page
Catholic Office Building, Toronto, Ont.	Ex., Pl.	Page & Warrington	September	287

ORATORIES—

Title and Location		Architect	Month	Page
Oratory, Montreal Residence	In., Pl.	E. & W. S. Maxwell	September	268-275

PORTRAITS—

Title and Location		Architect	Month	Page
Charles Dolphin			February	43
Henry Sproatt, LL.D., R.C.A.			June	170
David R. Brown			October	310

PUBLIC BUILDINGS—

Title and Location		Architect	Month	Page
Hunter Building, Ottawa, Ont.	Ex., In., Pl.	Public Works Department	January	2-5

RESTAURANTS—

Title and Location		Architect	Month	Page
Princes Limited, Toronto, Ont.	Ex., In.	Denison & Stephenson	October	317-319

RETAIL STORES—

Title and Location		Architect	Month	Page
Wm. Davies Company, Limited, Queen Street Store, Toronto	Ex., In., Pl.	Hynes, Feldman & Watson	July	213
Upper Facade, Wm. Davies Company, Limited, Queen Street Store, Toronto		Hynes, Feldman & Watson	November	357
Adams Furniture Company's Building, Toronto	Ex., In., Pl.	Wm. Steele & Sons Company	October	320-322
Store and Office Building, Bloor and North Streets, Toronto		C. J. Gibson	October	334

SCHOOLS—

Title and Location		Architect	Month	Page
New Educational Block, Royal Military College, Kingston, Ont.	Ex., Pl.	Public Works Department, R. C. Wright, Chief Architect	January	6- 9
Hart House, University of Toronto	Ex., In., Pl.	Sproatt & Rolph	May	136
Students' Work, Technical School, Toronto	Ex., Pl.		November	364-366

SCULPTURE—

Title and Location		Architect	Month	Page
Cast Bronze Statutes, Canadian War Records Museum, Ottawa, Ont.		Miss Florence Wyle (Sculptor)	June	196

ILLUSTRATIONS—*Continued*

Title and Location		Architect	Month	Page
Noontime in a Canadian Munition Plant		Miss Frances Loring (Sculptor)	June	197
War Memorial, Stratford, Ont.		Walter Allward (Sculptor)	August	264
Terminal Stations—				
Canadian National Terminal, Vancouver, B.C.	Ex., In.	Pratt & Ross	February	55- 58
Theatres—				
Allen Theatre, Winnipeg	Ex., In.	C. Howard Crane	April	123-125
Allen Theatre, Regina, Sask.	Ex., In.	A. J. Rowley	April	126
Pantages Theatre, Toronto	Ex., In.	Thomas W. Lamb	November	338-343
Loew's Uptown Theatre, Toronto	Ex., In.	Thomas W. Lamb	November	344-349
Y.M.C.A. Buildings—				
Y.W.C.A. Building, Edmonton, Alta.	Pl.	Magoon & Macdonald	June	191-193

SKETCH VIEWS

(By Chas. Dolphin)

Title and Location	Month	Page
St. Williams College, York, England	February	26
Goodhamgate, York, England	February	26
Front of Peterborough Cathedral	February	37
Paisley Abbey, Scotland	February	37
Edinburgh Castle	February	38
Melrose Abbey	February	39
Durham Cathedral and Castle	February	39
Elvet Bridge, Durham, England	February	40
Old Gate, Durham Cathedral	February	40
Westminster Bridge, London	February	41
Old Houses, Highpetergate, York, Eng.	February	42
Gargoyles, Lincoln Cathedral	February	42
Fishergate, York, England	February	43
Arc de Carousal, Paris	April	110
Musée de Cluny, Paris	April	110
Luxembourg Gardens, Paris	April	111
Details of Old Venetian Buildings	April	112
Chateau Pierrefond, France	April	113
Chateau Pierrefond Tower and Entrance Gate	April	114

Title and Location	Month	Page
Eiffel Tower, Paris	April	115
Venice from the Island of San Giorgo	April	116
One of the Wells of Venice	April	116
Porta Nuova, Verona	April	117
Arena at Verona	April	117
Piazza di Mercanti, Milan	April	118
Details of Fragments, Acropolis, Athens	August	234
Tower of the Winds, Athens	August	235
Seat of Chief Priest, Theatre of Bacchus, Athens	August	236
Monument of Lysikrates, Athens	August	237
Brick and Mosaic Work, Pompeii	August	238
Detail of Fragments and Marble Pool	August	239
Detail of Garden Furniture, Naples Museum	August	240
Ponte Vecchio, Florence, Italy	August	241
Arch of Constantine, Rome	August	242
Arch of Titus, Rome	August	242
Villa Adolphrandini, Rome	August	243
Monument before the Loggia, Florence	August	244
Chateau de Chaumont, France	August	245

ILLUSTRATIONS ACCORDING TO AUTHOR

Architect	Subject and Location	Month	Page
Allward, Walter S. (Sculptor)	War Memorial, Stratford, Ont.	August	264
Bond, C. H. Acton	Residence, Peterboro, Ont.	June	184, 185
Bond, C. H. Acton	Factory, Toronto	February	53- 54
Brown & Vallance	Factory, Montreal	February	46- 48
Crane, C. Howard	Theatre, Winnipeg	April	123-125
Comber, Sydney	Bakery, Toronto	January	14- 17
Denison & Stephenson	Restaurant Building, Toronto	October	317-319
Esenwein & Johnson (Watt & Blackwell, Associated)	Hotel (Addition), Toronto	July	202, 215
Gibson, C. J.	Stores and Offices, Toronto	October	334
Hogle & Davis	Remodelled House, Danville, Que.	July	216, 217
Hogle & Davis	House, Danville, Que.	July	218, 219
Hogle & Davis	House, Danville, Que.	December	400
Hynes, Feldman & Watson	Meat and Provision Store, Toronto	July	213
Hynes, Feldman & Watson	Nurses' Residence, Toronto	November	358, 359
Klein, Maurice D.	Memorial Fountain, Toronto	August	247
Klein, Maurice D.	Residence, Toronto	June	178, 179
Lamb, Thomas W.	Theatre, Toronto	November	338-343
Lamb, Thomas W.	Theatre, Toronto	November	344-349
Maxwell, E. & W. S.	Oratory, Montreal Residence	September	268-275
Moore, John M.	Residence, Township of London	July	220, 221
Molesworth, West & Secord	Residence, Toronto	June	188, 189
Molesworth, West & Secord	Country Residence, Port Credit, Ont.	June	176, 177
Molesworth, West & Secord	Residence, Toronto	June	186, 187
Magoon & Macdonald	Y.W.C.A. Building, Edmonton, Alta.	June	191-193
Mackenie, J. A.	Trust Building, Toronto	April	105-107
Marani, F. H.	House, Roches Point (Lake Simcoe), Ont.	December	391-394
Marani, F. H	House, Roches Point (Lake Simcoe), Ont.	December	394, 395
Page & Warrington	Residence, Toronto	September	288-290

ILLUSTRATIONS ACCORDING TO AUTHOR—*Continued*

Architect	Subject and Location	Month	Page
Page & Warrington	Residence, York Mills, Ont.	September	290, 291
Page & Warrington	Residence, Toronto	September	292, 293
Page & Warrington	Tennis House, Oakville, Ont.	September	294
Page & Warrington	Office Building, Toronto	September	287
Prack, Bernard H.	Factory and Offices, Toronto	December	383-388
Pratt & Ross	Terminal, Vancouver, B.C.	February	55- 58
Pringle & Son, T.	Warehouse and Offices, Montreal	February	49- 52
Rowley, A. J.	Theatre, Regina, Sask.	April	126
Siddell, J. W.	Country House, Toronto (Suburbs)	July	190
Smith, Eden, & Sons	Residence, Toronto	June	180, 181
Smith, Eden, & Sons	Residence, Toronto	June	182
Smith, Eden, & Sons	Residence, Toronto	June	183
Sparling, Wm. F., Co.	Factory, Chatham, Ont.	January	18, 19
Shepard & Calvin	Warehouse, (near) Weston), Ont.	January	20
Sproatt & Rolph	Students' Union Building, Toronto	May	136
Steele, Wm., & Sons Co.	Store and Warerooms, Toronto	October	320-322
Stevens & Lee	Hospital, Ottawa	December	371-374
Turner, Philip J.	Residence, Point Cavagnol, Como, P.Q.	June	172-175
Watson, Harold R.	Residence, Toronto	August	253
Watson, Harold R.	Residence, Toronto	August	254
Watson, Harold R.	Group Development, Toronto	August	255-257
Watson, Harold R.	Residence, Toronto	August	250-252
Wyle, Miss Florence (Sculptor)	Statues, War Records Museum, Ottawa	June	196
Loring, Miss Frances (Sculptor)	Bronze Panel, War Records Museum, Ottawa	June	197
Allward, Walter S. (Sculptor)	War Memorial, Stratford, Ont.	August	264
Crane, C. Howard	Theatre, Winnipeg	April	123-125
Watt & Blackwell	Trust Building, Toronto	April	108
Watt & Blackwell	Huron & Erie Mortgage Corporation (Branch), London, Ont.	April	109
Public Works Department, Wright, R. C., Chief Architect	Office Building, Ottawa	January	2- 5
Public Works Department, Wright, R. C., Chief Architect	Educational Block, School, Kingston, Ont.	January	6- 9

ARTICLES

Title	Month	Page
New Government Offices, Ottawa, Ont.	January	3- 5
Foundation Work, Bank of Hamilton Building, Winnipeg	January	8- 9
Heating Problems Produced by Some of the Modern Methods of Building Construction	January	10- 13
The Draftsman	January	22, 23
Building Summary	January	29
The Outlook for 1920	January	29- 31
Conference on Concrete House Construction	January	34
Leaves From an Architect's Sketch Book (Part I)	February	36- 44
Architecture in Toronto—A Resumé	February	44, 45
Recent Concrete Buildings	February	47- 50
Color in Decoration	February	50, 51
Zoning in Architectural Practice	February	51- 53
New Canadian National Terminal, Vancouver	February	55- 59
What is Regional Planning?	February	60
The Building Industries Conference	February	61- 66
Canadian Military Hospitals	March	70- 83
Ontario Housing Report	March	84- 86
Canada's War Hospital Development	March	87- 98
Bankers' Bond Building, Toronto	April	104-107
Leaves From an Architect's Sketch Look (Part II)	April	110-118
Memorial Windows	April	119-122
The Best Sort of Client	April	125, 126
Co-operation Encouraged by Fixed Fee Plan	April	127-129
Art After the War	April	130, 134
The Charm of Natural Planning	April	132
Hart House, University, Toronto	May	136-140
Hart House: A Description of Its Plan	May	141-151
Mechanical Equipment of Hart House	May	151-155
Hart House Theatre	May	155
Concrete—Its Use and Abuse	May	162-164
Henry Sproatt and His Work (an Appreciation)	June	171
Recent Examples of Domestic Work	June	173-186
Winning Design, Edmonton, Y.W.C.A.	June	191-194

ARTICLES—*Continued*

Title	Month	Page
Trimstone and Building Ornaments	June	195-198
A Sketch of the Old Houses of New England	July	203-209
The Town Planning Institute of Canada	July	210, 211
A Message From Mars	July	211, 212
Standardization in Building Construction	July	212
The Use of Steel in House Construction	July	222-230
Greek Design	July	223-230
Leaves From an Architect's Sketch Book (Part III)	August	235-245
O.A.A. Publicity Campaign (Specimen Advertisements)	August	262
R.A.I.C. Council Meeting	August	247-249
Examples of Recent House Design	August	251-256
Insulation of Concrete Walls	August	256-258
Surface-Treated Concrete and Stucco	August	259-261
An Oratory in a Montreal Residence	September	269
Douglas Fir or Oregon Pine	September	271
The London O.A.A. Convention	September	276-281
Presidential Address, O.A.A. Convention	September	281-283
The Business Conduct of an Architect's Office	September	283-286
Architecture	September	286
The General Relationship of the Contractor and the Architect	September	295-298
Inter-Allied Housing and Town Planning Congress of 1920	October	303-309
R.A.I.C. Assembly, Ottawa	October	311, 312
Labor in the Building Industry	October	312-316
Post-War Architectural and Building Problems	October	324-328
O.A.A. Notes	October	329
Letter re Western University	October	330
Synopsis of Cauchon Report on the London (Ont.) Railway Situation	October	333
New Toronto Theatres	November	339-346
The Suspicious Client	November	346-349
Battlefield Memorials	November	350-354
R.A.I.C. Council Proceedings	November	355-357
Community Development	November	360-362
O.A.A. Notes	November	362
U. S. Registration Laws	November	363
New Ottawa Civic Hospital	December	371
Concrete in Alkali Soils and Water	December	376-382
Pan-American Architects' Resolutions	December	388
The Flat Fee as a Measure of Equity	December	395
Report of New York Architects on Housing	December	396

EDITORIALS

Title	Month	Page
Toronto Live Stock Arena	January	27
Building Costs	January	27
O.A.A. Council Meeting	January	27
Building Costs	January	28
Ontario Architects' Association Pursuing Active Policy	February	67
Canadian Architects and Canadian Materials	February	67
Toronto School Building Programme	February	68
Canadian Materials and Foreign Products	March	99
Architects Confer With Customs Board	March	99
Canadian Roofing Materials	April	131
Ontario Architects Increase Fees	April	131
The Claims of the Canadian Architect	May	165
Regina Architects Form Local Chapter	May	165
Battlefield Memorials	June	199
The New Tax and the Building Industry	June	199
Plans, Taxes and Small Houses	July	231
Atelier System Proposed in England	July	252
The London Convention	August	263
The Question of Publicity	August	263
Architects to Compete for Monument	August	264
Industrial Art Exhibition, London	August	266
The R.A.I.C. Call	September	299
Housing Progress in Ontario	September	299
The Toronto Architects' Clinic	October	335
Toronto Builders' Exchange Reorganized	October	335
The Live Stock Arena	November	367
Standard Code of Practice	November	367
Town Planning Journal	November	367

Example of Carving and Metal Work

Through the munificence of the T. Eaton Company, Toronto, some seventeenth and eighteenth century furniture typical of the best work of that period in England, and which was secured by Dr. C. T. Currelly, the curator, on his recent trip abroad, is shortly to be added to the Royal Ontario Museum. The collection also contains a number of eighteenth century mantelpieces which are said to be of an extremely high degree of excellence, the carving in particular being of great delicacy and delightful design.

Another feature of interest is a room from a recently dismantled mansion built about 1740, which is being brought across the Atlantic and will be set up in the Museum as it stood in London. It is entirely of carved pine, and according to Dr. Currelly, represent a fine specimen of the grandeur and elaboration of that time, the carving being extraordinarily good, particularly over the alcove, for ornamental porcelains which were a characteristic feature of some of the early drawing rooms.

Besides this, the Museum has succeeded in obtaining a collection of decorative iron work —iron balconies, stairs, and many other important things from bank grilles to fences—lal valuable to the architectural student and craftsman. This latter gift, which was acquired at a considerable cost, was presented by Mr. Robert Mond of England, a recent visitor to Toronto, and who has been very generous to the Museum on previous occasions.

Other features of the added collection will include a number of sixteenth century plates from the artists of Italy, made in Feienza for the Medici family; some exquisite portrait plates from Castel Duranti; and various features of Savage ornament which are important in teaching design.

New Factory and Office Building of the Dunlop Tire and Rubber Goods Company
Queen Street and Booth Avenue, Toronto

THIS building is one of the finest examples of modern, fireproof, industrial building contruction, in Canada, particularly remarkable for the excellence of the concrete work, which was erected during the winter months of 1919-20. Plant executives contemplating the construction of new buildings or extensions should see this building.

EFFICIENT ECONOMICAL SERVICE JVG

John V. Gray Construction Co., Limited
General Contractors for Buildings
TORONTO WINDSOR

P Tech. C
Construction
v.13(1920)

Physical &
Applied Sci.
Serials

PLEASE DO NOT REMOVE
CARDS OR SLIPS FROM THIS POCKET

UNIVERSITY OF TORONTO LIBRARY